

Exhibit 13a

1 UNITED STATES DISTRICT COURT
2 SOUTHERN DISTRICT OF NEW YORK

3 IN RE: METHYL TERTIARY BUTYL * Master File
4 ETHER ("MTBE") PRODUCTS * No. 1:00-1898
5 LIABILITY LITIGATION *
6 ----- MDL 1358 (SAS)
7 COMMONWEALTH OF PUERTO RICO, * M21-88
8 et al., *
9 Plaintiffs, *
10 vs. *
11 Defendants. *

12 Case No. 07-CIV-10470 (SAS)
13 -----

14 The videotaped deposition of:

15 BRENDA TORANO,
16 former Shell Puerto Rico Limited (Sol Puerto Rico
17 Limited) employee, current Puma Energy employee, and a
18 non-party witness herein, was held at the law offices
19 of O'NEILL & BORGES, LLC, American International Plaza,
20 Suite 800, 250 Munoz Rivera Avenue, San Juan, Puerto
21 Rico 00918, on Thursday, September 26, 2013,
22 at 9:04 a.m.

23
24
25

<p style="text-align: right;">Page 38</p> <p>1 (Whereupon, the document is marked for 2 purposes of identification as Deposition 3 Exhibit No. 2.)</p> <p>4 MS. O'REILLY: Are you ready, Joanne?</p> <p>5 THE REPORTER: Yes.</p> <p>6 MS. O'REILLY: For the record, I've marked 7 as Exhibit 2 an e-mail chain in January of 2002 8 initiated by a Rob Hart and it's Bates stamped 9 SOL ESI 2-00009806 through 9808.</p> <p>10 BY MS. O'REILLY:</p> <p>11 Q. Have you had a chance to read it?</p> <p>12 A. (In English) Yes.</p> <p>13 THE INTERPRETER: "Yes."</p> <p>14 BY MS. O'REILLY:</p> <p>15 Q. Okay. I'll start with the bottom e-mail. 16 It's from a Rob Hart, Issues Manager, Oil Products, 17 Shell International Petroleum Company Limited.</p> <p>18 Do you recognize his name?</p> <p>19 A. No.</p> <p>20 Q. Okay.</p> <p>21 If you look on the first page, it looks like 22 someone named "Arturo Ponciano" forwarded it to-- this 23 e-mail to a number of people.</p> <p>24 Do you know who Arturo Ponciano is?</p> <p>25 A. (Through the interpreter) No. I remember</p>	<p>1 A. No. And if I remember correctly, it was 2 for the cluster, but I don't remember a specific name.</p> <p>3 Q. Okay.</p> <p>4 If you look down one, and right there it says, 5 "SCCA"--</p> <p>6 Do you see that next to his name?</p> <p>7 A. Uh-huh.</p> <p>8 Q. --do you know what "SCCA" stands for?</p> <p>9 A. I remember that that's the cluster, 10 Central and Caribbean.</p> <p>11 Q. Do you remember at any time, if we go to 12 the first page, the "Factbox"--</p> <p>13 A. Uh-huh.</p> <p>14 Q. --it talks about ethanol.</p> <p>15 Do you recall hearing about ethanol and use of 16 ethanol in gasoline during the time you were with 17 Shell?</p> <p>18 A. No.</p> <p>19 Q. Was there any discussion within Shell 20 Puerto Rico about using ethanol in gasoline?</p> <p>21 A. Not that I have any knowledge of.</p> <p>22 Q. And if you look partway down, about-- the 23 sentence starts, "Now the European Union"--</p> <p>24 Do you see that sentence?</p> <p>25 A. Yes.</p>
<p style="text-align: right;">Page 39</p> <p>1 having heard his name and I don't know if at some time 2 he was in Puerto Rico, but no.</p> <p>3 Q. You see his e-mail there, it says, 4 "SHGUAT."</p> <p>5 Do you recognize that e-mail address?</p> <p>6 A. I understand that it would be Guatemala, 7 but I don't know.</p> <p>8 Q. And this was sent to or from David Lewis.</p> <p>9 Do you recognize David Lewis' name?</p> <p>10 A. Yes.</p> <p>11 Q. And who is David Lewis?</p> <p>12 A. David was working for a time in what was 13 the cluster of Central and the Caribbean.</p> <p>14 Q. And it says "HSSE."</p> <p>15 Was he a health and safety person like you?</p> <p>16 A. Yes, he was like a general manager for 17 health and safety at the cluster level.</p> <p>18 Q. Did you report to him or interact with him 19 on a regular basis?</p> <p>20 A. I reported directly to the local company, 21 but we did have support, some kind of central support, 22 from the cluster.</p> <p>23 Q. Do you know which entity or with which 24 Shell entity David Lewis worked for? Do you know 25 exactly?</p>	<p>1 Q. It says, "Now the European Union is 2 requiring that ethanol be blended with petrol and 3 California will outlaw the polluting oxygenate methyl 4 tertiary butyl ether (MTBE) for replacement by 5 ethanol."</p> <p>6 Do you see that?</p> <p>7 A. Yes.</p> <p>8 Q. Do you remember hearing that California 9 and other states were banning the use of MTBE during 10 the time you were with Shell?</p> <p>11 A. The answer is yes, with the information 12 that I had looked for that I had found in EPA, within 13 that process.</p> <p>14 Q. Okay.</p> <p>15 And you see it says there "polluting oxygenate."</p> <p>16 Did you in or around 2002 after you started with Shell 17 learn about MTBE being a groundwater pollution problem?</p> <p>18 A. No.</p> <p>19 Q. Was there any discussion in or around the 20 time of this e-mail, in January 2002, within Shell 21 Puerto Rico, or your Shell cluster, about not using 22 MTBE in gasoline that was distributed in the area?</p> <p>23 A. No, I don't recall, and in Puerto Rico, as 24 I answered previously, in documents and information 25 that I had there was no MTBE in the gasoline after</p>

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1 station operators for instructions on how to handle 2 spills during the time that you were with Shell? 3 A. Specifically in which areas they were 4 changed, I don't remember. 5 Q. Okay. 6 Who, to your understanding, had the primary 7 responsibility for putting together the manuals and 8 making sure that they got to the operators? 9 A. It was the environmental area and the 10 sales area together, because those were the people that 11 had the daily contact with the retailer. 12 Q. Okay. 13 Going back to some of the names up here, do you 14 recognize Alejandro Espinosa? 15 A. I remember having heard the name, but no. 16 Q. Okay. 17 Is there anyone else on this, in the list of 18 people here, that were sent the e-mail whose name you 19 also recognize? 20 A. (In English) Yeah. Yes. 21 Q. Who's that? 22 A. Well, basically, I recognize some of the 23 people that used to work with Caribbean in different 24 areas. 25 Q. And can you point out a name for me.	1 (Whereupon, the document is marked for 2 purposes of identification as Deposition 3 Exhibit No. 3.) 4 BY MS. O'REILLY: 5 Q. No, go ahead and take your time and review 6 it. 7 MS. O'REILLY: For the record, I've marked 8 as Exhibit 3 a series of e-mails in and around 9 February two-- February and January, 2002. 10 They're Bates stamped SOL ESI 2-00009623 through 11 626. 12 BY MS. O'REILLY: 13 Q. All right. I want to start-- let's start 14 at the back, at the first e-mail, which I believe was 15 sent by you, and it's dated November 19, 2001. 16 Do you see that? 17 A. Yes. 18 Q. Now, this has got your name, Brenda 19 Torano, Retail-- 20 A. (In English) Commercial. 21 Q. --Commercial Environment Advisor, Shell 22 Caribbean and Central America. 23 Was that your cluster group, or is that the 24 company you were with? 25 A. It's the cluster group.
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1 A. Neville. 2 Q. Okay. 3 Anyone else's name that you recognize? 4 A. Carl Farley. Felino, he used to work in 5 the Caribbean also. Carlos Rodriguez. Julian Rojas. 6 Q. All right. 7 Did you have-- when you were HSE, did you have 8 any responsibility for the distribution outlets, like 9 terminals, like Catano, or anything like that? Did you 10 have responsibility for those facilities? 11 A. No, not directly. 12 Q. Was there someone else who had 13 environmental responsibility for those facilities? 14 A. The terminal managers themselves, and 15 sometimes if they need just to consultation, just to 16 get something, they ask. 17 Q. Okay. 18 What about Yabucoa? Did you have any 19 interaction with people at Yabucoa? 20 A. (Through the interpreter) No, that was a 21 different entity. 22 Q. What entity, to your understanding, was 23 responsible for Yabucoa? 24 A. Shell Chemical Yabucoa. 25 THE REPORTER: This would be Exhibit 3.	1 Q. Okay. 2 But you were employed by Shell Company Puerto 3 Rico Limited, correct? 4 A. (Through the interpreter) Correct. 5 Q. Okay. 6 And then this says "Don Johnny." Is that Juan 7 Vazquez? 8 A. Correct. 9 Q. Okay. 10 And he was your general manager at the time? 11 A. Correct. 12 Q. And the e-mail that you wrote to him says, 13 "During the past week personnel from the Environmental 14 Quality Board inform me (not an official communication) 15 several amendments to the UST regulation are going to 16 be proposed for the regulated community during 17 November 28th, 2001, for comments at a public hearing 18 30 days after around December 28th, 2001. Other 19 amendments proposed are for the UIC plan underground 20 injection control program that regulates the septic 21 tanks in our S/S." 22 Does "S/S" stand for "service station"?" 23 A. Correct. 24 Q. Okay. 25 Do you recall your conversation with the

Exhibit 13b

David Lewis

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ETHER ("MTBE") PRODUCTS §
LIABILITY LITIGATION, §
§ Master File No.
§ 1:00-1898
§ MDL 1358 (SAS)
§ No. M21-88
§
§

This document relates to:

COMMONWEALTH OF PUERTO RICO,
et al., §
§ Case No.
§ 07-civ-10470 (SAS)

Plaintiff,
vs.

SHELL OIL COMPANY, et al.,

Defendants.

- - -

NOVEMBER 22, 2013

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Videotaped deposition of DAVID LEWIS, held at
Sedgwick, LLC, Fitzwilliam House, 10 St. Mary Axe,
London, EC3A 8BF, England, commencing at
9:20 a.m. on the above date, before Joan L. Pitt,
Registered Merit Reporter, Certified Realtime
Reporter, and Florida Professional Reporter.

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GOLKOW TECHNOLOGIES, INC.
877.370.3377 ph | 917.591.5672 fax
deps@golkow.com

David Lewis

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<p>1 that there was, you know, no -- to understand whether 2 there was any contamination by -- by all products. This 3 wouldn't have been specific to MTBE, but it would have 4 been to ensure that there hadn't been any release of any 5 products that would have damaged those sensitive areas.</p> <p>6 Q. When you say proactive monitoring, does that 7 mean sampling groundwater?</p> <p>8 A. That would have been part of it, yes.</p> <p>9 Q. And was there guidance on what was considered a 10 sensitive area? Written guidance?</p> <p>11 A. I don't recall.</p> <p>12 Q. Was that something that you were tasked with, 13 developing guidance and what was considered a sensitive 14 area?</p> <p>15 A. Not above the examples I gave you in answer to 16 the previous question.</p> <p>17 Q. Were -- was any proactive monitoring of 18 groundwater done in Puerto Rico?</p> <p>19 MR. WALLACE: Object to the form insofar as it 20 may call for speculation.</p> <p>21 A. I don't know.</p> <p>22 Q. Did you recommend to the executive management 23 team that proactive monitoring of groundwater as part of 24 this strategy be done in Puerto Rico?</p>	<p>1 gasoline, not necessarily relating to gasoline 2 containing MTBE. So it tended to be a reaction to an 3 incident as part of our attempt to define the extent of 4 any contamination that had resulted from the incident 5 rather than a proactive approach when we weren't aware 6 that there had been a particular problem.</p> <p>7 Q. So is it fair to say that while you were 8 with -- had responsibility for the CCA and in -- when 9 you became zone manager that as of that time period the 10 strategy bullet of proactive monitoring of groundwater 11 had not yet been implemented?</p> <p>12 MR. WALLACE: Object to the form. Calls for 13 speculation.</p> <p>14 A. I don't think you can necessarily draw that 15 conclusion. I didn't, as far as I recollect, coordinate 16 a program for proactive monitoring.</p> <p>17 Q. Did anyone --</p> <p>18 A. It's possible at the local level that the 19 individual companies within the cluster, if they had 20 deemed it to be necessary, that they could have 21 instigated a monitoring program themselves, but that -- 22 that would have been a local decision rather than a 23 centrally coordinated decision.</p> <p>24 Q. Did anyone present you with a list of sensitive</p>
<p style="text-align: center;">Page 55</p> <p>1 MR. WALLACE: Object to the form.</p> <p>2 A. Not specific to Puerto Rico.</p> <p>3 Q. Did you recommend proactive monitoring of 4 groundwater for any location within the CCA?</p> <p>5 A. Those sensitive areas.</p> <p>6 Q. What areas were those?</p> <p>7 MR. WALLACE: Object to the form.</p> <p>8 A. I can't name areas. I can only describe the 9 type of area that would have been possibly considered to 10 be sensitive.</p> <p>11 Q. And after your presentation, using those 12 criteria, did you identify specific areas for proactive 13 monitoring of groundwater?</p> <p>14 A. Not over and above those that would have been 15 identified as part of the NERA process or other similar 16 processes.</p> <p>17 Q. Well, let me ask it this way. Was there any 18 area when you were within CCA where you implemented 19 proactive monitoring of groundwater?</p> <p>20 MR. WALLACE: Object to the form.</p> <p>21 A. I don't recall proactive monitoring of 22 groundwater generally. In most cases the monitoring we 23 did was as a result of specific incidents, not 24 necessarily containing -- not necessarily relating to</p>	<p style="text-align: center;">Page 57</p> <p>1 areas that they recommended that you implement proactive 2 monitoring of groundwater?</p> <p>3 A. Not that I recall.</p> <p>4 Q. When you gave this presentation, or any time 5 thereafter, did you personally believe that there were 6 any sensitive areas that were appropriate for 7 implementation of proactive monitoring of groundwater?</p> <p>8 MR. WALLACE: Object to the form insofar as it 9 calls for an opinion.</p> <p>10 A. Not that I recall.</p> <p>11 Q. Did you consult any of the subject matter 12 experts at your disposal to assist you in identifying 13 sensitive areas that may be appropriate for proactive 14 monitoring of groundwater?</p> <p>15 A. No. They wouldn't have had detailed knowledge 16 of the geography of the markets where we operated. That 17 would have been local knowledge rather than knowledge 18 that was held either within the cluster or at a zonal 19 level.</p> <p>20 Q. Did you consult with any of your local HSSE 21 managers, like Ms. Rodriguez, or anyone else who had 22 local knowledge and ask them to recommend sensitive 23 areas for implementation of proactive monitoring of 24 groundwater?</p>

David Lewis

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<p>1 A. There was an ongoing dialogue between the Shell 2 Company of Puerto Rico and the EPA regarding the 3 management of environmental affairs within Puerto Rico, 4 and both Vanessa Rodriguez and Brenda Torano were 5 heavily involved in -- over a lengthy period of time in 6 developing plans with the EPA and I believe it's called 7 the Environmental Quality Board for Puerto Rico. 8 Those -- the detail of those plans would have 9 been developed jointly in conjunction between those two 10 ladies on behalf of the company and those regulatory 11 bodies. So that -- and that's something which we 12 largely left them to handle on the basis of their 13 professional judgment and wouldn't interfere directly in 14 that process.</p> <p>15 So as part of that process, certainly I think 16 they would have looked at the question of monitoring 17 sites and so on, not just from an MTBE point of view, 18 but, again, from an overall contamination point of view, 19 but that's something that they would -- would have 20 discussed over a lengthy period of time with those 21 regulators.</p> <p>22 Q. I understand there was an ongoing process, but 23 my question was more so, given this bullet point and one 24 of the strategies developed was proactive monitoring of</p>	<p>1 MS. O'REILLY: And I'll object to counsel's 2 coaching. Go ahead. 3 A. As I said, not that I recall. 4 Q. Did you ever meet with any of the EPA or 5 Environmental Quality Board personnel during the ongoing 6 process in Puerto Rico that you've discussed? 7 A. No. 8 Q. Did they report to you on the progress of those 9 discussions with the EPA and the Environmental Quality 10 Board regarding the remediation strategies? 11 A. In general terms, they kept me advised of the 12 types of discussions they were having, but not in terms 13 of detailed plans or agreements going forth. 14 Q. Did they provide regular reports to you on the 15 process? 16 A. Not regular. There would have been irregular 17 updates, which would have been both verbal and the 18 occasional e-mail. 19 Q. Was anyone else outside of Shell Puerto Rico 20 involved in those discussions with the EPA and 21 Environmental Quality Board that you have described? 22 A. Not that I'm aware. 23 Q. Did you share with Ms. Rodriguez and Ms. Torano 24 the information that you had developed and received</p>
<p style="text-align: center;">Page 59</p> <p>1 groundwater, did you ever discuss with Ms. Rodriguez or 2 Ms. Torano implementation of that strategy in Puerto 3 Rico and ask them for recommendations of areas that 4 should have proactive monitoring?</p> <p>5 MR. WALLACE: Objection to the form.</p> <p>6 A. I don't recall.</p> <p>7 Q. Did you ever ask them to develop a proactive 8 monitoring plan for Puerto Rico?</p> <p>9 MR. WALLACE: Object to the form.</p> <p>10 A. As I've indicated already, the plan would have 11 been developed by those two ladies directly with the 12 regulatory authorities.</p> <p>13 Q. I understand they were in that process, but I'm 14 asking about the implementation of this MTBE strategy. 15 Did you discuss with them proactive monitoring of 16 groundwater for purposes of implementing this MTBE 17 strategy?</p> <p>18 A. Not that I recall.</p> <p>19 MR. WALLACE: I'm going to object to the form 20 and to the persistent rephrasing of the same 21 question. That one was asked and answered. The 22 mere fact that you're apparently dissatisfied with 23 the answer doesn't entitle you to badger the witness 24 by posing the question again.</p>	<p style="text-align: center;">Page 61</p> <p>1 about MTBE's environmental risks?</p> <p>2 A. They were both kept advised. Vanessa 3 Rodriguez, as I indicated earlier on, wasn't employed 4 for the complete duration of my tenure in CCA, so she 5 would have been advised of the situation as it currently 6 pertained at the time she was working in CCA. When she 7 was then replaced by Brenda Torano, she would have been 8 kept up-to-date in terms of this type of information. 9 Q. Did you, you yourself, provide them with the 10 information that you had received and reviewed in 11 putting together this presentation? 12 A. I don't recall the detail. We operated within 13 my team a regional structure. So I had three regional 14 HSSE managers. It's possible that information was 15 provided to either Vanessa or Brenda via the regional 16 HSSE manager. It's possible that I would have informed 17 her and occasions I think did inform them directly. So 18 it would have been a variety of communication 19 methodologies. 20 Q. Did you ever hold within your region for your 21 HSSE managers, both regional and the country managers 22 like Ms. Rodriguez, any workshops or meetings 23 specifically concerning MTBE? 24 A. No, not specifically on the subject of MTBE.</p>

Exhibit 13c

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UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

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IN RE: METHYL TERTIARY BUTYL §
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§
§
Defendants.

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NOVEMBER 21, 2013

CONFIDENTIAL - FOR OUTSIDE COUNSEL ONLY

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Videotaped deposition of IAN CHARMAN, as
30(b)(6) REPRESENTATIVE OF SHELL CHEMICAL YABUCOA,
INC., SHELL OIL COMPANY, SHELL TRADING (US) COMPANY;
SHELL WESTERN SUPPLY AND TRADING, AND SHELL
INTERNATIONAL PETROLEUM COMPANY, held at Sedgwick,
LLC, Fitzwilliam House, 10 St. Mary Axe, London,
EC3A 8BF, England, commencing at 9:12 a.m., on the
above date, before Joan L. Pitt, Registered Merit
Reporter, Certified Realtime Reporter, and
Professional Reporter.

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<p>1 haven't, is the answer.</p> <p>2 Q. Okay. Let me just ask a couple of quick</p> <p>3 questions. Under additional dates for deposition, you</p> <p>4 have January 1995 SPR spot contract with Hovensa. Do</p> <p>5 you see that?</p> <p>6 A. Yes.</p> <p>7 Q. SPR stands for Shell Puerto Rico?</p> <p>8 A. Puerto Rico, yes.</p> <p>9 Q. Okay. And then SWST stands for Shell Western</p> <p>10 Supply and Trading?</p> <p>11 A. Yes.</p> <p>12 Q. And it says SWST -- in the 1st of January,</p> <p>13 1998, it says: "SWST name change (from STC.)"</p> <p>14 Do you see that?</p> <p>15 A. Shell Trading Caribbean. Yes, I do.</p> <p>16 Q. Okay. Let me go back to Exhibit 1 and pull out</p> <p>17 the deposition notice. And page 4 is where it says,</p> <p>18 "Designated Issues." Do you see that?</p> <p>19 A. I do, yes.</p> <p>20 Q. And did you review these designated issues in</p> <p>21 order to prepare for your deposition?</p> <p>22 A. Yes, with Rick.</p> <p>23 Q. Okay. And did you prepare -- other than the</p> <p>24 one page that we've marked as Exhibit 2, have you</p>	<p>1 we still had -- "we", Shell West, still had supply</p> <p>2 contracts from PDV now from Curacao, and that product</p> <p>3 does not contain MTBE.</p> <p>4 Q. Okay.</p> <p>5 A. So as far as I was aware from my own personal</p> <p>6 experience, the Curacao product doesn't contain MTBE.</p> <p>7 Q. And how did you learn about Hovensa?</p> <p>8 A. Hovensa, when I came to the -- to take over</p> <p>9 Shell West at the beginning of 2005, we still had</p> <p>10 occasional supply contracts from Hovensa and we were</p> <p>11 taking the conventional grade, which doesn't contain</p> <p>12 MTBE.</p> <p>13 Q. And what is your understanding that</p> <p>14 conventional grade doesn't contain MTBE based on?</p> <p>15 A. The fact that it doesn't, really. The</p> <p>16 certificates of quality show either zero or de minimis</p> <p>17 amounts of MTBE.</p> <p>18 Q. And what do you consider de minimis?</p> <p>19 A. Anything that's below 0.5. The majority of the</p> <p>20 cargos have nothing in and some have small trace</p> <p>21 elements which will come through from pipeline</p> <p>22 commingling or something like that.</p> <p>23 Q. Now, did you in preparing for your deposition</p> <p>24 determine whether or not Shell Western or Shell West or</p>
<p style="text-align: center;">Page 51</p> <p>1 prepared any notes --</p> <p>2 A. No.</p> <p>3 Q. -- other notes?</p> <p>4 A. No.</p> <p>5 Q. Okay. And did you talk to anyone? I know you</p> <p>6 talked to Mr. de Cuba and Mr. Leek early on. Did you</p> <p>7 talk to anyone else in preparation for your deposition?</p> <p>8 A. No.</p> <p>9 Q. And then with respect to -- if you go through</p> <p>10 the designated issues, there's questions in here about</p> <p>11 MTBE and whether the gasoline supplied to Puerto Rico</p> <p>12 contained MTBE. What did you do to determine whether or</p> <p>13 not the gasoline supplied to Puerto Rico through Shell</p> <p>14 Western or Shell West contained MTBE?</p> <p>15 A. First of all, I relied upon my own knowledge of</p> <p>16 the product from Curacao and Hovensa, and I know that</p> <p>17 neither contained MTBE.</p> <p>18 Q. And how is it that you know that from your</p> <p>19 personal knowledge?</p> <p>20 A. From Curacao, because I was on the refinery</p> <p>21 site and I knew that we -- there was no MTBE there, and</p> <p>22 as far as I knew, they hadn't added MTBE. They</p> <p>23 certainly hadn't added MTBE before I left the Caribbean.</p> <p>24 And when I came back to the Caribbean in 2005,</p>	<p style="text-align: center;">Page 53</p> <p>1 any other Shell entity had a policy about provision of</p> <p>2 MTBE gasoline to Puerto Rico?</p> <p>3 A. In preparing for the deposition, there were</p> <p>4 policy documents shown to me, but in my prior life as</p> <p>5 general manager of Shell West I knew what the policy</p> <p>6 was, at least as far as trading was concerned.</p> <p>7 Q. And what was the policy?</p> <p>8 A. The -- as far as trading was concerned for</p> <p>9 supplies into the Caribbean and Central American area,</p> <p>10 which included Puerto Rico, was that if there had been</p> <p>11 no MTBE in the supply chain previously, we had to stay</p> <p>12 at no MTBE. If it was a new contract or a new site, it</p> <p>13 had to be no MTBE.</p> <p>14 If there was MTBE in the supply chain for one</p> <p>15 reason or another prior to early 2000s, if we had to</p> <p>16 continue using that supply chain for whatever reason,</p> <p>17 usually a political reason in the Caribbean, we would,</p> <p>18 but we were not allowed to increase the amount of MTBE</p> <p>19 coming through that supply chain. We were sort of</p> <p>20 capped, if you like, at the old levels.</p> <p>21 Q. And you said this -- when was this -- to your</p> <p>22 understanding, when was this policy enacted or</p> <p>23 implemented?</p> <p>24 A. Towards the end of '99. But just to be clear,</p>

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Page 58	Page 60
<p>1 Puerto Rico were being supplied by Shell Yabucoa, 2 ex-rack in Yabucoa, and my -- my reason for visiting and 3 talking to the person whose name I can't remember was to 4 talk about the supply from Yabucoa to Shell 5 Puerto Rico as a -- with a view to what was the price, 6 were there -- you know, was there a reasonable fair 7 price versus what they were likely to pay for imports. 8 Sort of like -- a bit of like of an advisor, really, on 9 pricing issues only. We didn't talk about quality at 10 all.</p> <p>11 Q. Was his name Hans Rudsen?</p> <p>12 A. Honestly, I can't remember him. I can picture 13 him, but I can't remember his name. I'm very sorry.</p> <p>14 Q. That's okay. Other than meeting with this -- 15 was he employed by Shell Puerto Rico?</p> <p>16 A. Yes.</p> <p>17 Q. He was employed by Shell Puerto Rico, to your 18 understanding, okay.</p> <p>19 Other than that meeting, do you recall at any 20 time that you met with individuals from Shell 21 Puerto Rico?</p> <p>22 A. Apart from that, no. He basically picked me up 23 at the airport and drove around to Yabucoa, we had the 24 meeting onsite at Yabucoa, and then he took me back to</p>	<p>1 A. No, I asked him about the supply point, did we 2 continue to supply from Curacao, because Curacao doesn't 3 have MTBE in the product, so I just asked about the 4 supply point.</p> <p>5 Q. And then with respect to Mr. Leek, is he still 6 employed with Shell?</p> <p>7 A. Yes. He is currently working in Dubai.</p> <p>8 Q. And what did you discuss with him?</p> <p>9 A. The same -- basically the same question. Were 10 the supplies -- he replaced me, if you recall, so he 11 covered the first part, were the supplies still from 12 Curacao, yes; and then Johnny was the second part after 13 Danny had left, with the same question.</p> <p>14 Q. And then Brian Davis, I can't remember, did you 15 talk to Brian Davis?</p> <p>16 A. No.</p> <p>17 Q. Do you know if he's still employed by Shell?</p> <p>18 A. I believe he is, yes.</p> <p>19 Q. Do you know where?</p> <p>20 A. He was employed in Shell Centre when I last 21 heard, so I don't know where he is now, though.</p> <p>22 Q. And -- okay. Anyone else that you've talked to 23 at all, other than Mr. Wallace, in preparation for your 24 deposition?</p>
<p style="text-align: center;">Page 59</p> <p>1 the airport.</p> <p>2 Q. Okay. Do you know who at Shell Puerto Rico, to 3 your understanding, was the person responsible for 4 communicating with Shell Western or Shell West on 5 nominating gasoline?</p> <p>6 A. Yes. I can't remember his name, but he's got a 7 funny first name. It's like Yolando or something or 8 other and then he shortens it down, but I can't remember 9 his name. He's on -- he's mentioned on the e-mails that 10 we have a copy of.</p> <p>11 Q. Okay.</p> <p>12 A. I can't remember his name, again.</p> <p>13 Q. Since your -- when you talked to -- initially 14 to Mr. de Cuba, you said several years ago, do you know 15 where he is now?</p> <p>16 A. He's retired. So he's either in Holland or 17 Aruba.</p> <p>18 Q. And what did you talk to him about?</p> <p>19 A. I asked him -- basically my understanding of 20 supplies to Puerto Rico from the viewpoint of Shell 21 Western Services was that Shell Western Services was 22 supplying from Curacao, and I asked him did that change 23 between when I left and when he left, and he said no.</p> <p>24 Q. Did you ask him about MTBE?</p>	<p style="text-align: center;">Page 61</p> <p>1 A. No.</p> <p>2 Q. Okay. I've got this lovely box of documents 3 for us.</p> <p>4 A. Yes.</p> <p>5 (Charman Exhibit No. 3 was marked for 6 identification.)</p> <p>7 Q. For the record, I've marked as Exhibit 3 a 8 September 15, 1987, Product Supply Contract, Unleaded 9 Mogas 91, OCT R + M/2. It's a memorandum, Shell Company 10 (Puerto Rico) Limited to Trading Committee, and it's 11 Bates stamped SOL 49769.</p> <p>12 Have you had a chance to review this?</p> <p>13 A. Me, yes.</p> <p>14 Q. Did you review this document in preparation for 15 your deposition?</p> <p>16 A. I'm not sure I did.</p> <p>17 Q. Okay. Can you tell me, to your understanding, 18 what this document is?</p> <p>19 A. It is a -- looks like it's a supply contract.</p> <p>20 It looks like it's a Shell Puerto Rico copy of a summary 21 of a supply contract from, they put Shell Western 22 Services, but I believe it's SITCO who were the contract 23 party, but it's summarizing the agreement.</p> <p>24 Q. And who was the contract -- you said</p>

Exhibit 13d

Juan M. Lopez

Page 1

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

X

In re: Methyl Tertiary Butyl Ether
("MTBE") Products Liability Litigation

X

Master File No. 1:00-1898
MDL No. 1358 (SAS)
M21-88

X

Commonwealth of Puerto Rico, et al.
v.
Shell Oil Co., et al.
Case No. 07-CIV-10470 (SAS)

X

— — —
TUESDAY, NOVEMBER 12, 2013

REDACTED VERSION - DOES NOT CONTAIN
CONFIDENTIAL INFORMATION

— — —

Videotaped Oral deposition of JUAN M. LÓPEZ, AS 30(b)(6) REPRESENTATIVE FOR SHELL CHEMICAL YABUCOA INC., held in the offices of Sedgwick LLP, Two Allen Center, 1200 Smith Street, Suite 1600, Houston, Texas, commencing at 9:33 a.m., on the above date, before Michael E. Miller, Fellow of the Academy of Professional Reporters, Registered Diplomate Reporter, Certified Realtime Reporter and Notary Public.

— — —
GOLKOW TECHNOLOGIES, INC.
877.370.DEPS | fax 917.591.5672
deps@golkow.com

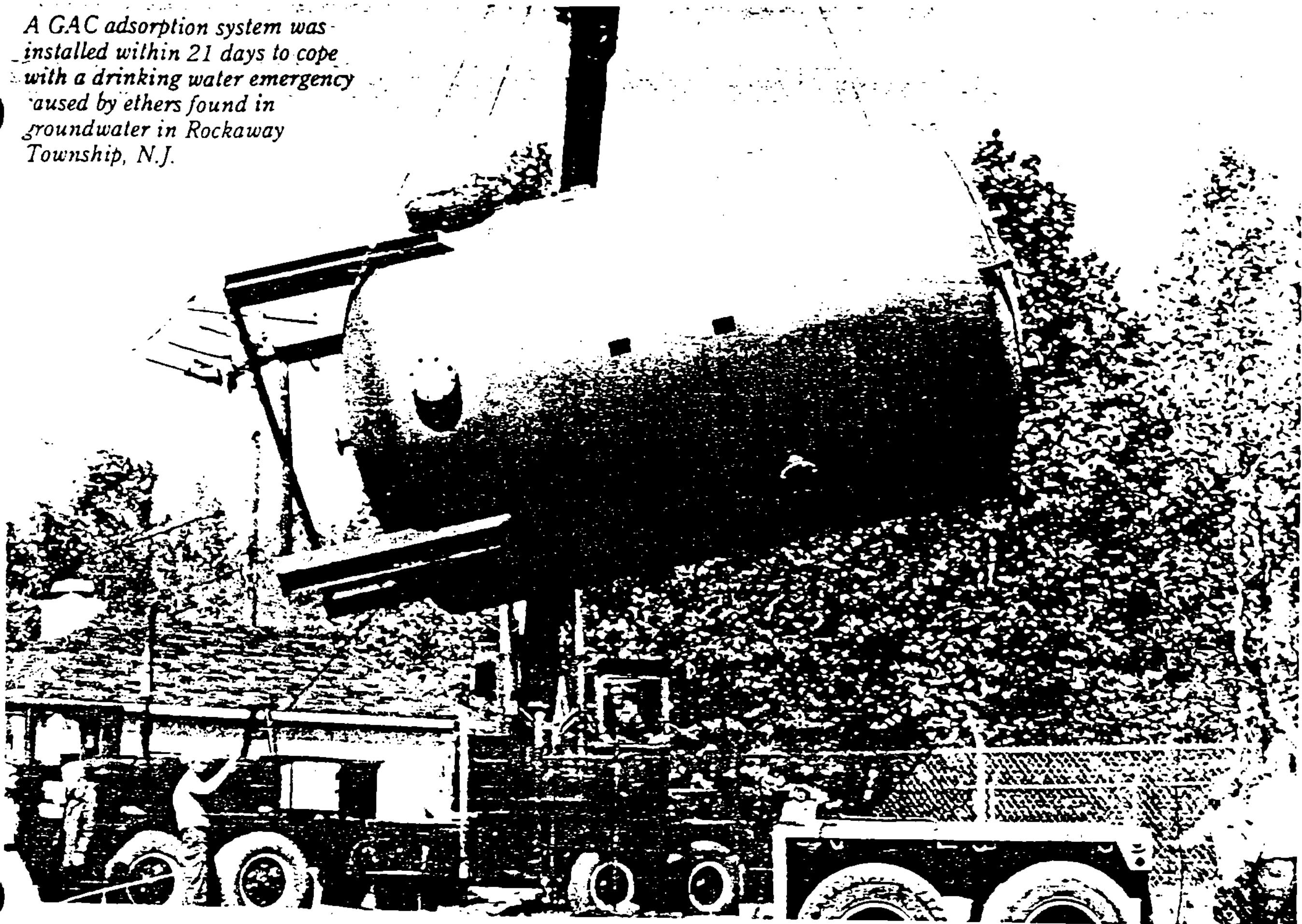
Juan M. Lopez

<p style="text-align: right;">Page 74</p> <p>1 the Norco shipment; is that correct? 2 A. Yes, sir. 3 Q. And these are both shipments 4 that went to Yabucoa? 5 A. Yes, sir. 6 Q. And once they went to Yabucoa, 7 any gasoline delivered to that terminal would 8 have been used somewhere in Puerto Rico, 9 correct? 10 A. It would be blended with other 11 gasoline in the terminal. As I mentioned, 12 the imported gasoline was a small fraction of 13 all the gasoline produced by Shell Chemical 14 Yabucoa, all the gasoline produced and sold 15 by Shell Chemical Yabucoa to sell in 16 Puerto Rico, yes. 17 Q. Well, collectively, this is a 18 shipment of 140,000 barrels of gasoline; is 19 that correct? 20 A. That is correct. That's a -- 21 the volumes, when they come up in these 22 rounded figures, is the amount order traded. 23 The actual amount would vary a small portion 24 from that number, but yeah, it would be 25 around 120,000 barrels and around 20,000</p>	<p style="text-align: right;">Page 76</p> <p>1 conclude that there is additional -- there 2 was additional volume in the -- in storage 3 when that shipment was received. 4 BY MR. MILLER: 5 Q. Was that the normal amount of 6 gasoline sold in a single day out of that 7 terminal, about 20,000 barrels? 8 A. It ranged from 14 to 20,000 9 barrels. 10 Q. Is that for all gasoline, or 11 just premium? 12 A. All gasoline. 13 Q. And what portion of the total 14 would be premium versus regular in any given 15 day? 16 A. It varied, but premium could 17 have been 15 to 20% of the total. 18 Q. Now, are these two shipments 19 and their certificate of analysis shown on 20 your summary? If we talk about Exhibit 9 and 21 Exhibit 10, does that show up on Exhibit 6 or 22 Exhibit 7? 23 You've got Exhibit 8 in your 24 hand. Get Exhibit 6 and Exhibit 7, please. 25 A. I have Exhibit 6 here, and the</p>
<p style="text-align: right;">Page 75</p> <p>1 barrels. 2 Q. 120,000 of premium and 20,000 3 of regular gas? 4 A. That's correct. 5 Q. Now, 120,000 barrels from a 6 single shipment, wouldn't that fill a tank, a 7 storage tank? 8 A. No. 9 Q. The storage tanks at Yabucoa 10 would hold how many barrels of gasoline? 11 A. Well, there are several tanks, 12 but generally, they hold over 200,000 13 barrels. 14 Q. Okay. Is there any way to know 15 how much gasoline was in that tank at the 16 time 120,000 barrels of premium gasoline 17 containing MTBE was placed in that same 18 container? 19 MR. WALLACE: Object to the 20 form. 21 A. It is very difficult to go back 22 in time, but generally at the site, there was 23 storage, or there was gasoline for two to 24 three weeks, so the -- assuming that the 25 sales were 20,000 barrels a day, you can</p>	<p style="text-align: right;">Page 77</p> <p>1 date was? 2 Q. February 20, 2007. 3 A. Yes. 4 Q. And what do you have as the 5 MTBE concentration on Exhibit -- is it 6 Exhibit 6 or Exhibit 7? 7 A. I'm looking now at Exhibit 6, 8 and on 2/20/2007, consistent with the 9 information you gave me, it has an MTBE 10 result of .04% by volume. And the one for 11 2/20/07, regular unleaded, has an MTBE result 12 of .11% by volume, consistent with the data, 13 yes. 14 Q. Okay. So when there's a number 15 entered without a less-than sign under the 16 "MTBE" column, that's the amount of MTBE 17 present in the imports to Yabucoa, correct? 18 A. Yes, sir. 19 Q. And there's a report that MTBE 20 is present on a June 25th, 2004, shipment by 21 Oil Tanking to the Yabucoa facility, correct, 22 in Exhibit 6? 23 MR. WALLACE: I'm sorry, can 24 you repeat that, please? 25 MR. MILLER: Yes.</p>

20 (Pages 74 to 77)

Exhibit 14a

A GAC adsorption system was installed within 21 days to cope with a drinking water emergency caused by ethers found in groundwater in Rockaway Township, N.J.



Removing Organics From Groundwater Through Aeration Plus GAC

Ronald J. McKinnon and John E. Dyksen

The Rockaway Township (N.J.) water utility installed a granular activated carbon (GAC) system to remove ethers and trichloroethylene that suddenly began contaminating its groundwater supplies. The system was installed expeditiously and performed well, but the carbon became exhausted within shorter and shorter periods of time. The solution was to add an aeration system prior to GAC treatment to extend the useful life of the carbon. As influent levels of the organic contaminants abated, the township was able to use aeration alone and to eliminate continuous use of the GAC system, maintaining it for contingencies only.

There is growing concern that trace organic contamination of drinking water supplies could be dangerous to human health. Attention has thus been focused on treatment processes for removing organics from drinking water, particularly for controlling volatile organic compounds (VOCs) that occur in groundwater. In fact, several communities have

installed aeration or granular activated carbon (GAC) adsorption facilities or both to remove VOCs from groundwater supplies.

One community in northern New Jersey—Rockaway Township—experienced the contamination of its groundwater supply by several VOCs. To remove the VOCs from its water supply,

Rockaway Township recently installed both aeration and GAC adsorption facilities. The use of these processes for controlling trace organics, rather than taste- and odor-producing compounds, is a relatively new concept in the drinking water industry. This article reviews Rockaway Township's treatment system for controlling VOCs.

Treatment for trace organics

Rockaway Township is located along Interstate 80 in north-central New Jersey. The township has a population of about 20 000 persons, most of whom are supplied with potable water from municipal water supply systems. Approximately

half of the township's population is served by a groundwater supply system that is owned and operated by the township. The remainder of the population is served by the water supplies of adjoining municipalities or by individual wells.

Rockaway's groundwater supply system consists of three wells, all of which are located about 24 m (80 ft) from each other (Figure 1). The capacities of the three wells are: well 4, 21 L/s (350 gpm); well 6, 33 L/s (550 gpm); and well 7, 60 L/s (1000 gpm).

When the wells are pumping simultaneously, the combined capacity of the system is about 7.5 ML/d (2 mgd) because of head constraints. Each of the wells is approximately 30 to 60 m (100 to 200 ft) deep and taps an unconsolidated glacial deposit.

Historically, the township's groundwater supply exhibited good quality and required only disinfection prior to pumping into the distribution system. In November 1979, trichloroethylene (TCE) was detected in wells 4 and 6. Consistently high levels of TCE were found in each well: 50 to 100 $\mu\text{g}/\text{L}$ in well 4 and 170 to 220 $\mu\text{g}/\text{L}$ in well 6. Both wells are near the suspected source of contamination, which is about 487 m (1600 ft) east of the wells (Figure 1).

In the absence of federal regulations for TCE, the New Jersey Department of Environmental Protection (NJDEP) is using the following guidelines concerning VOCs in the state's drinking waters: for a single VOC, the maximum allowable level is 50 $\mu\text{g}/\text{L}$; for total VOCs the maximum allowable level is 100 $\mu\text{g}/\text{L}$. If VOC levels in a water supply exceed these concentrations, NJDEP determines whether the water supply should be taken out of service, given its size and importance in relation to the remainder of the municipality's water supply. Based on the TCE levels detected in wells 4 and 6 and the township's water demands, these wells were taken out of service. The largest of the township's wells, well 7, was not affected and remained in service.

In order to maintain low levels of TCE in well 7 and avoid complete shutdown of the water supply, the township decided to pump well 6 to waste, thereby keeping the contaminant plume from migrating to well 7. For about nine months, flow from well 6 was pumped directly to Beaver Brook, which is a tributary of the Rockaway River. During this time, TCE levels in well 7 remained below 5 $\mu\text{g}/\text{L}$.

Also during this time, the township began to investigate alternatives for dealing with the TCE contamination problem. Three alternatives were considered:

- Drilling a new well in the western portion of the township;
- Purchasing water from the neighboring municipality of Dover; and

• Treating the contaminated wells.

The first option would have required several years to investigate potential well sites and to install a new well with sufficient capacity and quality. The second option would have required purchasing water at a higher price than that of the water the township could supply from its own wells. Also, interconnecting pipelines and meters would have had to be constructed to implement this option. Treatment options that were considered included aeration and GAC adsorption.

While the township was investigating the alternatives, the contamination problem worsened, and in October 1980 two ether compounds were detected in the groundwater supply. Diisopropyl ether (DIPE) and methyltertiary butyl ether (MTBE) were found at sufficiently high levels to cause severe taste and odor problems in the water. Well 7 exhibited DIPE and MTBE levels from 70 to 100 $\mu\text{g}/\text{L}$ and 25 to 40 $\mu\text{g}/\text{L}$, respectively. Taste and odor threshold concentrations for both of these compounds were determined to be between 5 and 15 $\mu\text{g}/\text{L}$. As a result, numerous taste and odor complaints were received from the township's residents.

The mayor therefore declared a water emergency and the township council provided funding to take immediate action to reduce the levels of organics in the three wells. As an interim measure, township residents were advised not to drink the water and were instructed to obtain drinking water from the township municipal building and other locations in the township that received water from unaffected neighboring supply systems.

After considering the available treatment options, the township decided that GAC adsorption would provide the optimum and most expedient solution to the organics problem. A manufacturer* provided a GAC adsorption system within 21 days, and the treatment system was placed in operation. The residents were then advised that the water was safe to drink.

Based on the TCE levels initially detected in the wells, the carbon was expected to last six to eight months before regeneration was necessary. However, after three months of operation, the concentration of DIPE in the contactor effluent was 14 $\mu\text{g}/\text{L}$, MTBE was 23 $\mu\text{g}/\text{L}$, and TCE was not detected. Therefore, it was necessary to replace the carbon every two months at a cost of about \$32 000. By the end of 1981, the carbon was being replaced at a rate of about once every four to six weeks.

Because of the quick breakthrough of the ether compounds, aeration as a pretreatment step to the GAC adsorption system was investigated. Pilot-scale tests were conducted, using a packed-column

aeration process. The test results indicated that adequate removals could be achieved with aeration. Also, the life of the carbon could be prolonged by reducing the influent ether levels to the GAC contactors. Consequently, a packed column was installed in December 1981.

The township's current treatment system consists of both aeration and GAC adsorption for VOC removal, shown in Figure 2. Water is pumped from the wells to the packed column, after which the water is repumped through the GAC contactors and into the distribution system. Since the treatment systems have been installed, influent levels have varied for each compound.

Influent organic levels

Since the discovery of organics in the township wells, TCE levels have generally remained between 200 and 300 $\mu\text{g}/\text{L}$. The levels fluctuate considerably because the suspected source is across the path of the normal flow of the aquifer. Levels of contaminants are also affected by the intermittent pumping of the nearest well, well 6. Levels of organic contaminants therefore tend to be higher during the summer months when well 6 is used more frequently.

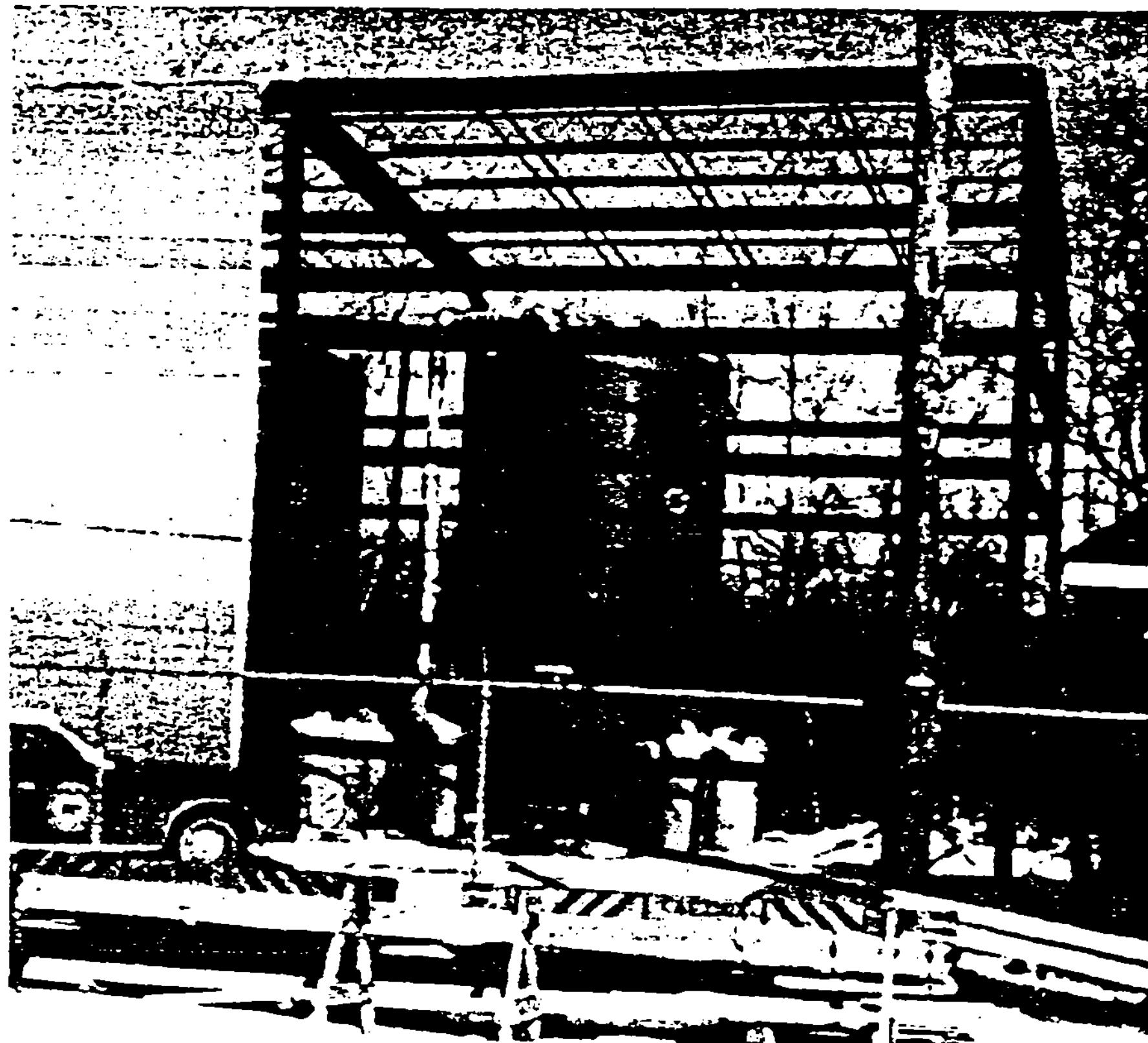
Both DIPE and MTBE levels, however, are affected by the cone of influence of well 7, which is the main producing well and is pumped on a constant daily schedule. A plot of the influent levels is shown in Figure 3. Both chemicals appeared in the supply at low levels in November 1980. The concentrations increased to levels of about 50–60 $\mu\text{g}/\text{L}$, remained fairly constant for about 11 months, and then began to decrease. In February 1983 the concentrations declined to nondetectable levels of DIPE and approximately 10 μg MTBE/L. Since that time, the levels of MTBE have been slowly declining.

During the period of increasing concentrations, the DIPE level was consistently higher than that of MTBE. For a four-month period, they were essentially the same, and during the period of decreasing concentrations, the level of MTBE was consistently higher than that of DIPE. Since it is believed that both originated from the same spill at approximately the same concentration, the DIPE seems to have traveled faster than the MTBE. Benzene and toluene, which were associated with the spill, have not yet been detected.

Aeration treatment system

Groundwater from the three township wells is pumped to the packed column, located adjacent to well 7. The packed-column aeration system is believed to be one of the first of its kind in the country for removing volatile organics from a

*Calgon Corp., Pittsburgh, Pa.



A prefabricated building was installed around the carbon contactor to prevent the valves from freezing.

municipal water supply. A description of the aeration system, the basis for its design, and current operating data are discussed.

Description. The aeration system consists of a countercurrent packed column in which packing materials are used to provide large void volumes and a large surface area. The water flows downward by gravity, and air is forced upward. The untreated water is distributed on the top of the packing by means of a distribution tray, and the air is blown through the column in a forced draft. This design results in continuous and thorough contact of the liquid with the gas and minimizes the thickness of the water layer on the packing, thus promoting efficient mass transfer.

Water from the well is pumped to the top of the column through a 200-mm (8-in.) pipeline. The water flows down through the packing media by gravity. An orifice-type liquid distributor is used to distribute water at the top of the column. Also, a de-mister mat was installed above the distribution plate to eliminate misting from the top of the column.

A schematic diagram of the packed column is shown in Figure 4. The column dimensions and key design criteria are: capacity (i.e., flow rate), 84 L/s (1400 gpm) or 7.5 ML/d (2 mgd); diameter, 3 m (9 ft); packing height, 7.6 m (25 ft); overall height, 10 m (35 ft); packing media, 762-mm (3-in.) polyethylene tel-

lerettes;* airflow rate, 17 700 L/s (37 500 cu ft/min); air-to-water ratio, 200:1; removal efficiency, 99.9 percent removal of DIPE.

The tellerettes are of a toroidal helix design and have been used in small wet scrubbers, cooling towers, contaminant separators, and stripping columns. This packing has a reported surface area of 2.7 m^2 (30 sq ft) per 0.02 m^3 (1 cu ft) and a free volume of 92 percent. The column contains 46.4 m^3 (1640 cu ft) of the tellerettes.

Air is blown upward through the countercurrent packed column with two 74-kW (100-hp) centrifugal blowers, each rated at 12 744 L/s (27 000 cu ft/min) at 4064 mm (16 in.) water gauge. The blower controls are coordinated with the operation of the pumps. When the well pumps turn on, the blowers also turn on automatically.

Treated water from the column is collected in a clear well located directly under the column. The column and the clear well are constructed of aluminum. This material was selected to provide nominal maintenance because of its resistance to corrosion. The clear well has a capacity of 22 523 L (5950 gal) and provides a detention time of about 5 min. Treated water is pumped by two booster pumps from the clear well to the GAC treatment system. Each booster pump is rated at 42 L/s (700 gpm) at 786 kPa (114 psi) and is driven by a 55-kW (75-hp) motor. The operation of the booster

pumps is controlled by the operation of the well pumps and by the water level in the clear well.

Subzero temperatures are often encountered in Rockaway Township. Because of the large volume of air being blown through the column, freezing was a concern. Based on the assumption that there would be a complete transfer of heat between the water and the air, heat transfer calculations indicated that only a small drop in water temperature would occur even under subfreezing conditions. To verify these calculations, temperature measurements were collected in January 1983. The air temperature was -7.7°C (18°F) and the influent water temperature was 10.5°C (51°F). The temperature of the air delivered to the column after compression by the blower was not measured, although it is believed that this temperature was somewhat higher than -7.7°C (18°F), because of compression. The column water effluent temperature was measured at 9.4°C (49°F), representing only a 1°C (2°F) loss through the column. Temperatures as low as -31°C (-24°F) have been encountered since the start-up of operations without causing any freezing problems in the column.

Design basis. To determine design criteria for the column, pilot-scale tests were conducted at the well site, using a 300-mm (12-in.) diameter column packed with about 3 m (10 ft) of 7.6-cm (3-in.) tellerettes. The pilot column was operated at several water flow rates and air flow rates to simulate full-scale loading rates. Water samples were collected at the top and the bottom of the column and at selected intermediate points to determine removal efficiency.

During the pilot tests, influent DIPE and MTBE levels ranged from 15 to 40 $\mu\text{g/L}$ for each compound. Results of three test runs are listed in Table 1.

As shown from the data, relatively high air-to-water ratios were required to achieve good removal efficiencies. The pilot test conditions were less than optimum because the tests were conducted quickly to expedite design and construction. The ratio of the diameter of the column to the diameter of the packing was small, and liquid distribution was not optimum. Because of the urgency of the situation, however, the tests were considered adequate to yield a conservative design.

Diisopropyl ether was more easily stripped than MTBE. These levels of removal are generally consistent with the theoretical principles of gas mass transfer; i.e., the transfer of a compound from a liquid state to a gas depends on the Henry's law constant of the compound. A compound with a high Henry's law constant is generally more easily

*Cellcote Co., Beria, Ohio.

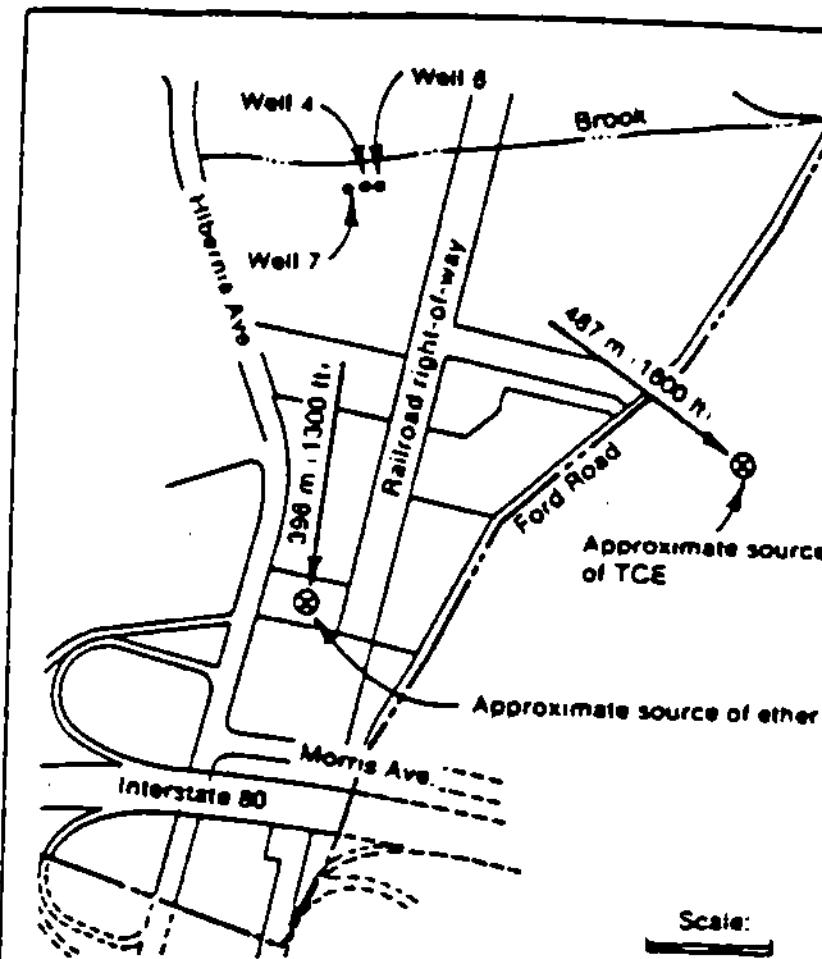


Figure 1. Location of Rockaway Township supply wells

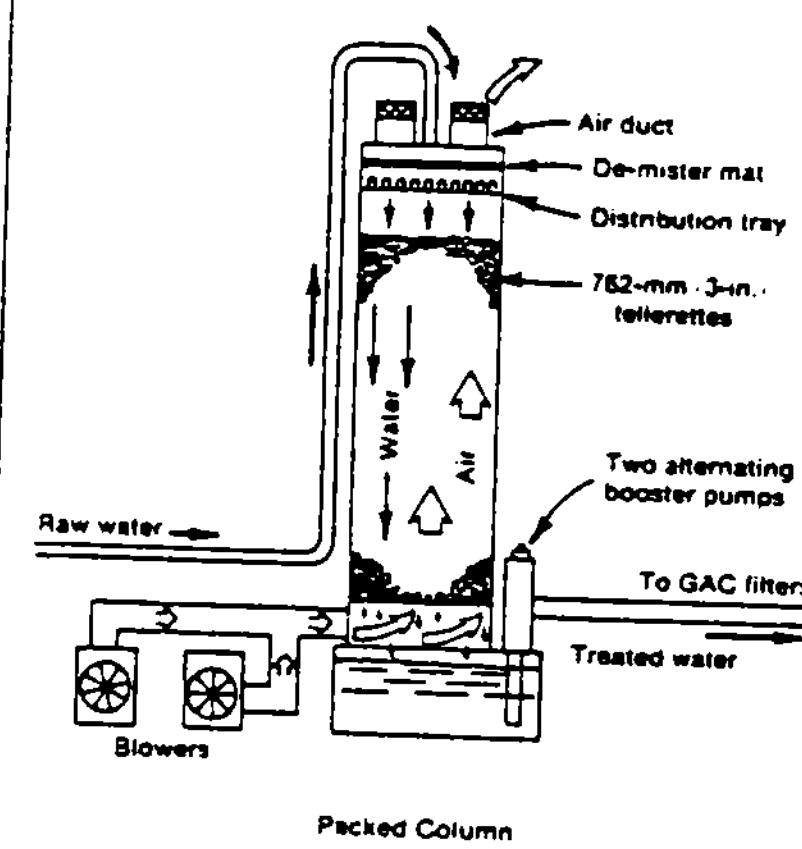


Figure 2. Schematic of the Rockaway Township treatment system

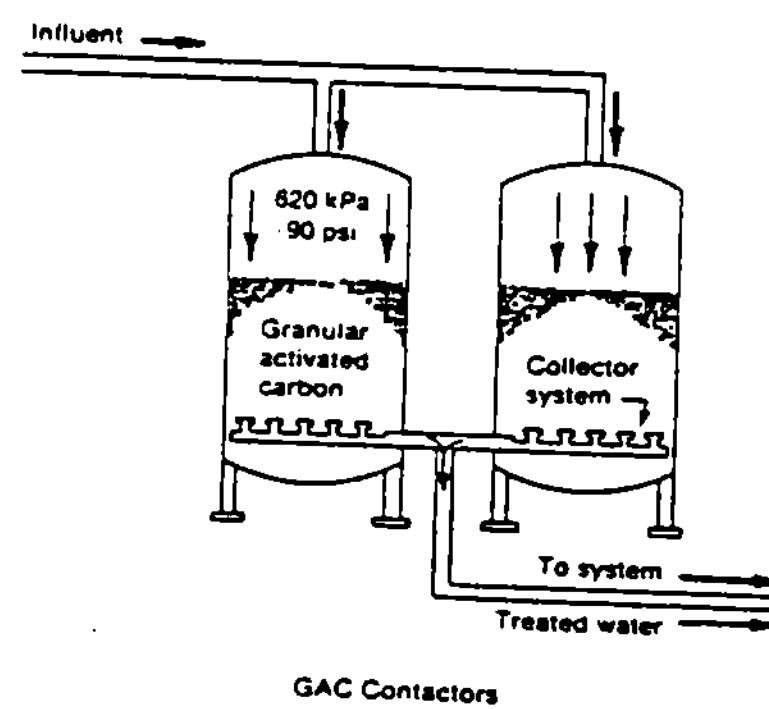


Figure 3. Historical trends in organic levels

TABLE 1
Pilot test results of air stripping for removal of organic compounds

Contaminant	Air-to-Water Ratio	Influent Concentration µg/L	Effluent Concentration µg/L	Removal Percent
Diisopropyl ether (DIPE)	44:1	15.3	7.0	54
Methyltertiary butyl ether (MTBE)	44:1	14.0	7.8	44
Trichloroethylene (TCE)	44:1	217.9	39.6	82
Diisopropyl ether (DIPE)	75:1	14.4	5.5	62
Methyltertiary butyl ether (MTBE)	75:1	13.1	6.4	51
Trichloroethylene (TCE)	75:1	203.6	35.8	82
Diisopropyl ether (DIPE)	125:1	14.1	4.2	71
Methyltertiary butyl ether (MTBE)	125:1	13.1	4.8	63
Trichloroethylene (TCE)	125:1	203.6	27.0	87

stripped from water than one with a low constant. Of the compounds found in the township's wells, DIPE has an estimated Henry's law constant of 0.08, and MTBE has a constant of 0.05. In contrast, TCE has a Henry's law constant of 0.5. Therefore, one would expect that TCE would be most readily removed, whereas DIPE and MTBE would be more difficult to remove.

Because of the relative difficulty in stripping the ether compounds, it was determined that an aeration process

capable of removing as much DIPE and MTBE as possible would result in removing a sufficient amount of TCE. The dimensions of the column were based on a desired removal efficiency of 99.9 percent of the DIPE, and since DIPE was determined to be the compound causing most of the taste and odor problems, a finished water level of 4 µg/L was considered low enough to avoid the taste and odor problems. An influent DIPE level of 4000 µg/L was chosen, based on a hydrogeological study of the ground-

water system and on the quantities of DIPE that were suspected to have leaked into the aquifer.

The pilot data were used to determine mass transfer relationships and the height of a transfer unit required to remove the various compounds. Because DIPE was determined to be the critical compound, design criteria were computed with the data for this compound. From the pilot data, the mass transfer relationship for DIPE was determined to vary from 14 to 20 hours⁻¹, depending on

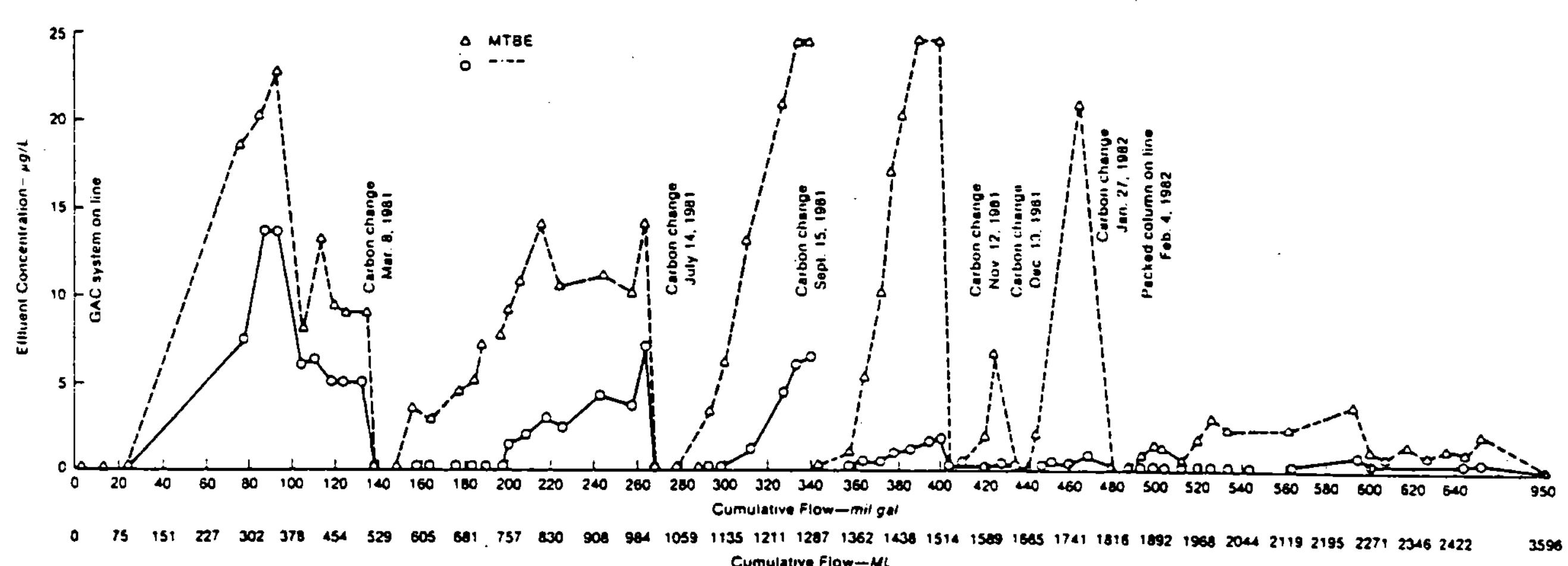


Figure 5. Breakthrough curves for DIPE and MTBE in Rockaway Township

the liquid loading rate. The heights of the transfer units for the airflow rates tested were calculated to range from 2 to 3 m (6 to 9 ft).

Using these data and a removal efficiency of 99.9 percent for DIPE, packing heights of more than 15 m (50 ft) were calculated for air-to-water ratios of about 100:1. Consequently, the data for heights of the transfer unit were extrapolated to higher air-to-water ratios (200-300:1) to reduce the height of the column. A final air-to-water ratio of 200:1 was selected to yield a packing height of 7.6 m (25 ft).

Operating data. The packed column was installed during December 1981 and January 1982 and was put online on Feb. 4, 1982. Operating data from the column indicate removal efficiencies similar to the projected removals based on the pilot-scale tests. Therefore, scale-up procedures used in the design proved to be accurate.

Since the column has been in use, DIPE levels in the raw water have ranged from nondetectable to 107.2 µg/L. Removal efficiencies have generally been greater than 99 percent. In contrast, MTBE removal has generally been about 95 percent, and TCE has always been completely removed. These removal efficiencies are also consistent with the pilot test results. As planned, the aeration system significantly reduces the organic loading to the GAC system.

GAC adsorption treatment system

Treated water from the packed column is pumped with booster pumps to the GAC adsorption system. The GAC system consists of two downflow pressure contactors that are operated in parallel. Each contactor is 3 m (10 ft) in diameter and 6 m (20 ft) high, and each contains 9072 kg (20 000 lb) of carbon (bituminous coal-based granular carbon, 8 × 30 mesh).* The design parameters of the system are: rated capacity, 60.9 L/s (1000 gpm); surface loading rate, 4.2

mm/s (6.3 gpm/sq ft); contact time, 12 min; and operating mode, downflow, single parallel beds. A schematic diagram of the GAC system is shown in Figure 4.

Aerated water is pumped through the GAC contactors and then directly into the distribution system. The head loss across the contactors has been measured at 68.9 kPa (10 psi). Before the aeration system was installed, this loss affected the total capacity of the township's well supply—the pumping rate was reduced because the well pumps had to operate against a higher head. The installation of the booster pumps in conjunction with the aeration system helped correct this problem. Water from the contactors is chlorinated prior to entering the distribution system.

Because of time constraints, the two GAC contactors were installed outdoors. During the first portion of winter operations, extremely cold weather almost resulted in the freezing of several valves located on the underside of the contactors. The contactors were subsequently housed in a prefabricated building to protect piping and valves from freezing during the winter months.

When the GAC becomes exhausted, the spent carbon is removed pneumatically into a sealed tank truck, and the contactors are refilled with virgin carbon. The supplier of the carbon removes and disposes of the spent carbon. When the new carbon is placed in the contactors, the system must be backwashed to remove fines in the carbon. The backwash is discharged to a nearby brook. A discharge permit from the NJDEP is required for this method of disposing of the backwash.

Operating data. The GAC adsorption system was initially placed in service in late October 1980. At that time, influent levels of the organics were 10 µg/L of TCE, 70-80 µg/L of DIPE, and 25 to 35 µg/L of MTBE. For about two months, levels of these organics in the effluent

from the GAC were below detectable limits. By January 1981, although TCE levels in the effluent were below detectable limits, DIPE and MTBE were beginning to break through the GAC. By March 1981, after about four months of operation, the breakthrough of the ether compounds resulted in taste and odor complaints from township residents, so the carbon was replaced. The second carbon charge also lasted about four months before breakthrough occurred. Influent DIPE and MTBE levels were about 10 to 20 µg/L during the second four months of operation. In July 1981, the carbon was again replaced.

About four weeks after the third carbon charge was installed, DIPE and MTBE in concentrations of about 1 µg/L began to break through. By September 1981, only two months after the carbon was installed, breakthrough was again high enough to require replacement of the carbon. The fourth carbon charge also lasted only two months before becoming exhausted. By this time, influent DIPE and MTBE levels had risen to about 35 µg/L and 30 µg/L, respectively. By September 1981, the township began to investigate the use of aeration to prolong the life of the carbon.

In early February 1982, eight days after the carbon had been replaced for the sixth time, the aeration system was placed in service. After that time, the influent of the GAC system had DIPE and MTBE levels of about 2 µg/L, substantially lower than the levels of 37.7 µg/L for DIPE and 29.7 µg/L for MTBE prior to aeration. For the initial two weeks of operation with the packed column, effluent levels from the GAC system were less than 1 µg/L. However, after two weeks DIPE and MTBE began to desorb from the GAC, and levels in the effluent rose to 2 to 3 µg/L, which was more than the influent levels. This

*Calgon F-300, Pittsburgh, Pa.

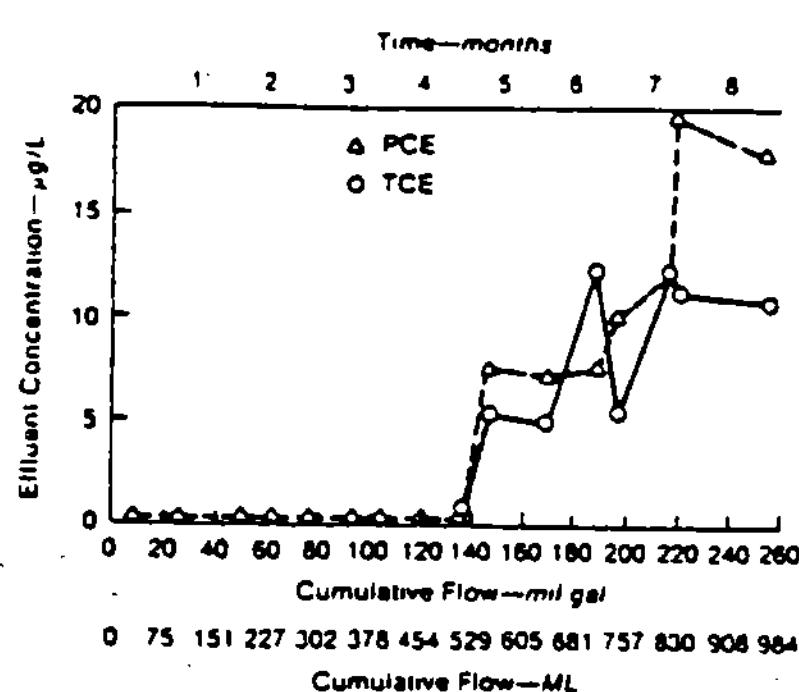


Figure 6. Breakthrough curves for TCE and PCE in Rockaway Borough

desorption occurred through December 1982. After this time, apparently both DIPE and MTBE had been sufficiently desorbed that the effluent levels dropped to less than 1 µg/L.

A plot of the breakthrough curve for the GAC system is shown in Figure 5. The effects of aeration are indicated by the increased life of the GAC before breakthrough. Based on the influent levels, flow rates, and breakthrough to 4 µg/L, carbon usage rates for the ether compounds were calculated as:

- Without aeration, 0.45–0.90 kg (1.0–2.0 lb) of GAC per 3785 L (1000 gal) water treated; and
- With aeration, <0.04 kg (<0.1 lb) of GAC per 3785 L (1000 gal) water treated. Aeration has significantly reduced the usage rate of the carbon for removing these compounds. The carbon usage rates for TCE removal could not be determined because the levels of TCE in the GAC effluent have consistently been below detectable limits.

Borough operating data. A comparison of operating data from Rockaway Township with those of Rockaway Borough, N.J., which also had a GAC adsorption system, was made and evaluated for breakthrough and the carbon usage rate.

The borough's GAC system, placed online in June 1981, consists of three 9072-kg (20 000-lb) units. The borough uses a GAC system* but does not have aeration as a pretreatment process. Organic compounds in the borough's water include TCE at concentrations ranging from 30 to 50 µg/L and tetrachloroethylene (PCE) at concentrations ranging from 150 to 250 µg/L.

The borough's first carbon charge lasted about seven months before breakthrough occurred. A plot of the breakthrough curve for the borough's system is shown in Figure 6. The carbon usage rate to remove the compounds detected in the borough's water were calculated to be 0.09 kg (0.2 lb) of GAC per 3785 L

(1000 gal) of water treated, based on a breakthrough of about 10 µg/L.

This value is considerably less than the carbon usage rate prior to aeration for the ether compounds found in the township's water. These results generally confirm reports that higher-molecular-weight compounds are more readily adsorbed on GAC than are lower-molecular-weight compounds.

Economics of the township's system

Prior to the need for extensive treatment of the township's groundwater supply, the operating cost of providing potable water for residents was about \$0.27/3785 L (1000 gal) of water. This cost primarily resulted from operation of the pumps and chlorination of the well water. With the addition of the aeration and GAC adsorption systems, it is estimated that the operating cost of providing potable water in the township has increased to \$0.48/3785 L (1000 gal) of water treated. However, it is estimated that this cost will be reduced to \$0.40/3785 L (1000 gal) when the existing well pumps are operated at a lower head.

Cost of the aeration system. The primary components of the construction cost for the packed column were the column, packing media, blowers, piping, controls, site work, and booster pumps. The total cost for these items was estimated in late 1981 to be \$375 000. If this cost were amortized over 20 years at a 10 percent interest rate, the average annual cost would be \$45 000.

Operation of the packed column is fully automatic. Therefore, the major operating cost is power to operate the blowers and the booster pumps. The estimated power cost for this equipment is \$100 000 annually, based on a unit cost of \$0.09/kW·h.

Cost of the GAC adsorption system. The primary components of the construction cost of the GAC system were the contactors, the GAC, piping, site work, and the building. The total cost of these items was estimated in late 1980 to be \$200 000. An exact cost for the system is difficult to obtain because much of the labor to install the system was supplied by township personnel. If this cost were amortized over 20 years at a 10 percent interest rate, the average annual cost would be \$24 000.

Operation of the GAC system, like the aeration system, is fully automatic. Therefore, most of the operating cost is replacement of the carbon. Prior to the installation of the aeration system, the annual cost of replacing the carbon was estimated to be \$200 000, or \$0.52/3785 L (1000 gal) of water treated. Since the installation of the aeration system, the carbon has not had to be replaced because the aeration system is removing most of the contaminants.

These costs represent total costs for

the construction and operation of the treatment system. The township was able to trace the source of the ether contamination and therefore has not had to bear the burden of most of these costs but is continuing to investigate the source of the TCE contamination.

Summary and conclusions

The groundwater supply of the township of Rockaway, N.J., was contaminated by TCE and two other compounds. Through the application of aeration and adsorption treatment techniques, the township has been able to continue to use its wells and to maintain sufficient water quality to protect its residents. The combination of aeration and a GAC system reduced the contaminant levels to below detectable quantities. The GAC system used alone was effective, but the cost of operation was reduced by one third to one half by installation of an aeration system. The total cost of the aeration system was about 55 percent of the cost of the GAC system.

In July 1983, the GAC system was taken offline because of the excellent performance of the aeration system and because of reduced influent levels of the ether compounds. This permitted additional pumping of the supply wells as a result of reduced head loss.

The primary concern about taking this action was the possibility of bacteria building up in the stagnant environment of the carbon, which, as an integral part of the system, must be maintained so that it can be put online immediately. Options were to drain and chlorinate the carbon, drain it and chlorinate heavily before use, drain it and treat it with a high-pH solution before use, or continually pump 1.2 L/s (20 gpm) of aeration-treated water through it. It was decided that a small amount of water flowing through the carbon, combined with regular monitoring, would be the most effective method. That solution is currently being implemented and appears to be working effectively.



About the authors:

Ronald J. McKinnon is township engineer for Rockaway Township, 65 Mt. Hope Road, Rockaway, NJ 07866. His first priority upon joining the township in 1980 was

to find a solution to the volatile organic contamination of the township's water supply. For his successful effort, he was given the "project of the year" award by the New Jersey Society of Municipal Engineers. John E. Dyksen is a senior engineer with Malcolm Pirnie, Inc., 100 Eisenhower Drive, Paramus, NJ 07653.

*Filtrasorb 300, Calgon Corp., Pittsburgh, Pa.

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Chemical Category	METHYL TERT-BUTYL ETHER		

Exhibit 14b



TSCA Section 8(e) Reporting Guide

June 1991

NOTICE TO ADMINISTRATOR OF SUBSTANTIAL RISKS. Any person who manufactures, [imports,] processes, or distributes in commerce a chemical substance or mixture and who obtains information which reasonably supports the conclusion that such substance or mixture presents a substantial risk of injury to health or the environment shall immediately inform the [EPA] Administrator of such information unless such person has actual knowledge that the Administrator has been adequately informed of such information.

-- Section 8(e), Toxic Substances Control Act (1976)

Office of Toxic Substances
Office of Pesticides and Toxic Substances
U.S. Environmental Protection Agency
Washington, D.C. 20460

EPA's March 16, 1978 Section 8(e) policy statement ("Statement of Interpretation and Enforcement Policy; Notification of Substantial Risk" 43 FR 11110) also requires immediate reporting of "Emergency Incidents of Environmental Contamination" (EIEC). An EIEC is an environmental contamination (accidental or intentional in nature) involving a chemical known to be a serious human or environmental toxicant and which because of the extent, pattern and amount of the contamination (1) seriously threatens humans with cancer, birth defects, mutation, death or serious or prolonged incapacitation (e.g., neurotoxicologic effects, serious reproductive system effects), or (2) seriously threatens non-human organisms with large-scale or ecologically significant population destruction.

WHAT INFORMATION IS NOT REPORTABLE UNDER SECTION 8(E)?

There are several kinds of information about which the Agency considers itself to be adequately informed already for the purposes of Section 8(e) of TSCA. For example, information that otherwise meets the criteria for Section 8(e) reporting need not be submitted if the information meets one or more of the following criteria:

- (1) is contained in an EPA study or report.
- (2) is published in the open scientific literature.
- (3) has been submitted already to EPA under another mandatory reporting provision of 1) TSCA, or 2) some other authority that is administered by EPA.
- (4) is contained in a formal publication/report or a formal statement made available to the general public by another Federal agency.
- (5) is corroborative (in terms of, for example, route of exposure, dose, species, time to onset, severity, species, strain, etc.) of a well-established adverse effect.

It is important to note, however, that information that newly identifies a serious toxic effect at a lower dose level for example, or confirms a serious effect that was previously only suspected, is not considered by EPA to be corroborative and should be reported under Section 8(e) of TSCA.

- (6) is information for which the EPA Administrator has waived compliance with TSCA in general or Section 8(e) specifically upon a request and determination of the President of the United States that such a waiver is required in the interest of the national defense; Section 22 of TSCA outlines the procedures by which such waivers are to be requested/issued.

Exhibit 14c

1 SUPERIOR COURT OF CALIFORNIA
2 COUNTY OF SAN FRANCISCO
3 BEFORE THE HONORABLE CARLOS T. BEA, JUDGE PRESIDING
4 DEPARTMENT NUMBER 514

5 ---000---

6 SOUTH TAHOE PUBLIC UTILITY)
7 DISTRICT,)
8 PLAINTIFFS,) CASE NO. 999128
9 VS.)
10 ATLANTIC RICHFIELD CO., ET)
11 AL.,)
12 DEFENDANTS.) VOLUME 5
) PAGES 584 - 708

13 REPORTER'S TRANSCRIPT OF PROCEEDINGS

14 TUESDAY, OCTOBER 2, 2001

15 APPEARANCES OF COUNSEL:
16 FOR PLAINTIFFS:

17 MILLER, SHER & SAWYER
18 UNIVERSITY PARK OFFICES
19 100 HOWE AVENUE, SUITE S120
20 SACRAMENTO, CA 95825-8218
21 BY: DUANE MILLER, ESQ.
22 VICTOR SHER, ESQ.

23 FOR DEFENDANTS SHELL OIL, TEXACO, EQUILON:

24 SEDGWICK, DETERT, MORAN & ARNOLD
25 ONE EMBARCADERO CENTER, 16TH FLOOR
26 SAN FRANCISCO, CA 94111-3765
27 BY: STEPHEN JONES, ESQ.

28 FOR DEFENDANTS TOSCO:

29 LATHAM & WATKINS
30 633 WEST FIFTH STREET, SUITE 4000
31 LOS ANGELES, CA 90071-2007
32 BY: JOHN LYONS, ESQ.
33 JON ANDERSON, ESQ.

34 REPORTED BY: JO ANN BRYCE, CSR #3321, RMR, CRR
35 RHONDA L. AQUILINA, CSR #9956, RMR, CRR

1 THE PRIOR ONE. IF WE CAN COME UP WITH AN EFFICIENT WAY TO DO
 2 THIS SO WE DON'T HAVE TO KEEP INTERRUPTING, I'D LIKE TO DO THAT.
 3 THE COURT: ALL RIGHT. THE EFFICIENT WAY OF GETTING A
 4 LIMITING INSTRUCTION IS JUST TO SAY, "MAY WE HAVE A LIMITING
 5 INSTRUCTION." ONE OF YOU GENTLEMEN SAY THAT.
 6 MR. DE RECAT: THAT'S FINE.

7 THE COURT: YES, THIS EXHIBIT, LADIES AND GENTLEMEN, THIS IS
 8 A SHELL DOCUMENT. IT CAN BE ONLY USED AGAINST SHELL AND YOU'VE
 9 BEEN SO INSTRUCTED.

10 MR. MILLER: Q. MR. STANLEY, IF YOU COULD TURN --
 11 THE COURT: IN EVIDENCE.

12 (PLAINTIFF'S EXHIBIT 162 RECEIVED IN
 13 EVIDENCE)

14 MR. MILLER: Q. -- TO THE PAGE OF THE SHEET PREPARED BY
 15 SHELL PERSONNEL. THE NUMBER AT THE BOTTOM OF THE PAGE IS 278.
 16 EACH PAGE IS NUMBERED.

17 A. OKAY.

18 Q. OBVIOUSLY I HAVEN'T GIVEN YOU 278 PAGES. IT'S A DOCUMENT
 19 THAT WAS NUMBERED AS A PART OF A SERIES.

20 AND THERE'S A COMMENT THERE BY SHELL PERSONNEL, "TASTE
 21 THRESHOLD IN WATER," AND IT STATES:

22 "BASED ON THE ROCKAWAY, NEW JERSEY, GROUNDWATER
 23 CONTAMINATION STUDY, IT WAS DETERMINED," REFERRING TO
 24 THE TASTE THRESHOLD FOR MTBE IN WATER, "TO BE IN THE
 25 RANGE OF 5 TO 15 PARTS PER BILLION."

26 DO YOU SEE THAT STATEMENT?

27 A. YES.

28 Q. DOES THAT REFRESH YOUR MEMORY ON THE LEVELS OF MTBE IN

1 ROCKAWAY WATER THAT CAUSED TASTE AND ODOR COMPLAINTS?

2 A. AGAIN, I THINK THERE WAS SOME UNCERTAINTY WITH ROCKAWAY, AND
 3 I DON'T KNOW IF THAT CAME ACROSS IN THIS DOCUMENT. BUT MTBE WAS
 4 NOT THE ONLY OXYGENATE IN THE WATER AND WAS NOT THE ONLY
 5 CHEMICAL IN THE WATER. THERE WERE ALSO CHLORINATED SOLVENTS
 6 FROM THE CHEMICAL FACILITY IN THE VALLEY.

7 AND BASED ON -- BASED ON MY KNOWLEDGE OF THAT SITE, THE ODOR
 8 AND TASTE ISSUES RELATED TO THEIR DRINKING WATER SUPPLY HAD TO
 9 DO WITH BOTH MTBE AND DIISOPROPYL ETHER.

10 Q. BUT IN THIS DOCUMENT, SHELL PERSONNEL REPORT THAT THE TASTE
 11 THRESHOLD IN WATER FOR MTBE WAS DETERMINED TO BE IN THE RANGE OF
 12 5 TO 15 PARTS PER BILLION; CORRECT?

13 A. WELL, IT SAYS "TASTE THRESHOLD IN WATER."

14 Q. MR. STANLEY, AFTER THIS INCIDENT, WHEN YOU INVESTIGATED THE
 15 ROCKAWAY INCIDENT, DID YOU REPORT IT TO SHELL MANAGEMENT?

16 A. YES.

17 Q. DID YOU REPORT IT TO SHELL MANAGEMENT AT CORPORATE
 18 HEADQUARTERS?

19 A. WELL, SINCE I WAS IN CORPORATE HEADQUARTERS, THEY WERE AWARE
 20 OF IT.

21 Q. BUT YOU DECIDED TO PERSONALLY BRING IT TO THEIR ATTENTION
 22 BECAUSE YOU THOUGHT IT WAS A SIGNIFICANT INCIDENT AT THE TIME IN
 23 1980; IS THAT CORRECT?

24 A. ANY TIME A WATER SUPPLY IS IMPACTED, TO ME THAT'S A
 25 SIGNIFICANT INCIDENT, BUT IT WAS MY FIRST EXPERIENCE AND I
 26 BELIEVE OUR FIRST EXPERIENCE WITH MTBE AND -- SO THAT WAS --
 27 THAT WAS SOMETHING THAT WE REPORTED TO MANAGEMENT.

28 Q. COULD YOU BE MORE SPECIFIC, PLEASE? WHO AT THE SHELL

1 CORPORATE HEADQUARTERS DID YOU REPORT THIS TO, AS BEST YOU CAN
 2 RECALL, AND WHEN?

3 A. WELL, AS BEST I CAN RECALL, I NOTIFIED MY SUPERVISOR. I
 4 NOTIFIED THE MANAGER OF RETAIL ENVIRONMENTAL ENGINEERING AND I
 5 NOTIFIED THE MANAGER FOR ENVIRONMENTAL AFFAIRS.

6 Q. NOW, THE MANAGER FOR ENVIRONMENTAL AFFAIRS AT THE TIME WAS
 7 THE PERSON WHO HELD THAT POSITION RESPONSIBLE FOR THAT ACTIVITY
 8 AT CORPORATE HEADQUARTERS AND FOR PEOPLE WORKING UNDER HIM FOR
 9 SHELL THROUGHOUT THE UNITED STATES?

10 A. I BELIEVE SO.

11 Q. SO BASICALLY YOU WENT TO THE HIGHEST PERSON IN MANAGEMENT
 12 THAT DEALT DIRECTLY WITH THE ISSUE OF GROUNDWATER CONTAMINATION
 13 ASSOCIATED WITH GASOLINE STATIONS AT THE TIME; IS THAT CORRECT?

14 A. WELL, I WENT TO TWO MANAGEMENT ENTITIES. ONE WAS THE
 15 ENVIRONMENTAL AFFAIRS MANAGER FOR -- WHO WAS MY DEPARTMENTAL
 16 HEAD, AND ALSO NOTIFIED THE RETAIL ENGINEERING GROUP MANAGER.

17 Q. WITHIN A SHORT TIME AFTER THE ROCKAWAY, NEW JERSEY,
 18 INCIDENT, IN AS LITTLE AS A YEAR, WERE THERE OTHER INCIDENTS
 19 INVOLVING MTBE AND GROUNDWATER THAT CAME TO YOUR ATTENTION?

20 A. THERE MAY HAVE BEEN.

21 Q. IS IT HARD FOR YOU NOW TO RECALL THE DETAILS OF THE DATES?

22 A. I'VE LOOKED AT HUNDREDS OF SITES IN MY EMPLOYMENT, AND I
 23 CAN'T -- IT'S HARD TO -- IT'S DIFFICULT TO REMEMBER ALL THE
 24 SITES. IF I HAD SOME NOTES OR SOMETHING TO REFER TO, MAYBE THAT
 25 WOULD HELP.

26 Q. I'LL PROBABLY HELP YOU WITH THAT IN A FEW MINUTES, BUT I
 27 THINK WE SHOULD FINISH WITH THIS DOCUMENT --

28 A. OKAY.

1 Q. -- BEFORE WE MOVE ON TO ANOTHER ONE, SIR.

2 THE NEXT POINT YOU MAKE --

3 THE COURT: ARE YOU GOING BACK TO EXHIBIT 1?

4 MR. MILLER: YES, YOUR HONOR.

5 Q. -- IS POINT FIVE, THE DIFFICULTY IN HIGH COST ASSOCIATED
 6 WITH TREATING MTBE IN WATER.

7 DID YOU LEARN THAT AS A RESULT OF THE ROCKAWAY INCIDENT?

8 A. WELL, I THINK WHAT WE LEARNED WAS, BECAUSE, AGAIN, REMEMBER
 9 WHAT I WAS SAYING EARLIER WAS OUR FOCUS WAS ON SEPARATE PHASE
 10 GASOLINE, HERE'S ANOTHER THING I'M BRINGING UP.

11 WHEN WE USED TO HAVE RELEASES OF GASOLINE, WE USED TO
 12 HAVE -- THERE WERE A LOT OF STEEL TANKS IN PLACE, AND THE SIZE
 13 OF THE RELEASES WHEN I FIRST STARTED WAS RELATIVELY LARGE

14 COMPARED TO THE TYPES OF RELEASES YOU SEE TODAY. AND IT WASN'T
 15 UNUSUAL TO SEE FREE-PHASE GASOLINE IN MONITORING WELLS FLOATING
 16 ON TOP OF THE WATER. AND SO A LOT OF OUR FOCUS WAS IN

17 UNDERSTANDING WHERE THIS GASOLINE WAS MIGRATING TO BECAUSE WE
 18 DIDN'T WANT IT GETTING INTO PEOPLE'S BASEMENTS, WE DIDN'T WANT
 19 IT GETTING INTO SUBWAYS, WE DIDN'T WANT IT GETTING INTO
 20 UTILITIES BECAUSE OF THE OBVIOUS SAFETY ASPECTS OF THAT. SO
 21 THERE WAS A LOT OF FOCUS EARLY ON IN THAT.

22 AND THEN THERE WAS ALSO FOCUS ON THE SOLUBLE CONSTITUENTS IN
 23 GASOLINE, AND THAT PRIMARY FOCUS BEING BTEX, BENZENE, TOLUENE,
 24 ETHYL BENZENE AND XYLENE. SO THE TYPES OF TREATMENT
 25 TECHNOLOGIES THAT WE WOULD USE TO TREAT BTEX HAD TO DO WITH WHAT
 26 WE CALL AIR STRIPPING WHERE YOU PERCOLATE WATER WITH THESE
 27 CONSTITUENTS IN IT THROUGH COLUMNS WITH LITTLE PACKING IN IT AND
 28 YOU BLOW AIR UP THROUGH THE COLUMNS, AND YOU BASICALLY STRIP OUT

00709

1 SUPERIOR COURT OF CALIFORNIA
2 COUNTY OF SAN FRANCISCO
3 BEFORE THE HONORABLE CARLOS T. BEA, JUDGE PRESIDING
4 DEPARTMENT NUMBER 514
5 ---OOO---
6 SOUTH TAHOE PUBLIC UTILITY)
7 DISTRICT,)
8)
9 PLAINTIFFS,) CASE NO. 999128
10 VS.)
11 ATLANTIC RICHFIELD CO., ET)
12 AL.,) VOLUME 6
13 DEFENDANTS.) PAGES 709 - 839
14)

13 REPORTER'S TRANSCRIPT OF PROCEEDINGS
14 WEDNESDAY, OCTOBER 3, 2001

15 APPEARANCES OF COUNSEL:

15. DIFFERENCES OF COURSES
FOR PLAINTIFFS:

16 FOR PENTINING.

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21 BY: DUANE MILLER, ESQ.
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23 FOR DEFENDANTS SHELL OIL, TEXACO, EQUILON:
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BY: JOHN LYONS, ESQ.
JON ANDERSON, ESQ.

28 REPORTED BY: JO ANN BRYCE, CSR #3321, RMR, CRR
RHONDA L. AQUILINA, CSR #9956, RMR, CRR

00713

1 WEDNESDAY, SEPTEMBER 25, 2001 1:45 P.M.
 2
 3 THE COURT: MR. STANLEY, COULD YOU PLEASE RETAKE THE STAND?
 4 CURTIS STANLEY,
 5 CALLED AS A WITNESS FOR THE PLAINTIFF, HAVING BEEN PREVIOUSLY
 6 DULY SWEORN, TESTIFIED FURTHER AS FOLLOWS:
 7 CROSS-EXAMINATION (RESUMED)
 8 MR. MILLER: Q. GOOD MORNING.
 9 MR. STANLEY, EXHIBIT 1 WAS WRITTEN IN 1998, AND AT THAT TIME
 10 YOU DESCRIBED MTBE AS ONE OF THE BIGGEST ENVIRONMENTAL ISSUES
 11 THAT U.S. OIL COMPANIES ARE FACING. IS THAT STILL TRUE TODAY?
 12 A. IN MY OPINION IT IS.
 13 Q. OKAY. AND HAVE THE REASONS CHANGED AT ALL OR PRETTY MUCH
 14 THE SAME?
 15 A. GENERALLY ABOUT THE SAME.
 16 Q. NOW, IF WE TAKE YOU BACK TO 1980, WHEN THIS PROBLEM WAS
 17 FIRST DISCOVERED, YOU KNEW AT THAT TIME THAT MTBE HAD A HIGH
 18 MIGRATION POTENTIAL BASED ON YOUR EXPERIENCE IN NEW JERSEY; IS
 19 THAT CORRECT?
 20 A. RELATIVE, AGAIN, THAT WOULD BE TRUE.
 21 Q. AND GOING BACK TO THE SAME TIME PERIOD, AT THAT POINT YOU
 22 DIDN'T HAVE SEVERAL HIGH VISIBILITY MUNICIPAL WELL SYSTEMS, YOU
 23 HAD A FEW IN NEW JERSEY; IS THAT CORRECT?
 24 A. I DON'T KNOW ABOUT HIGH VISIBILITY. WE DID HAVE SOME
 25 IMPACTS TO SOME WELLS IN THE NORTHEAST.
 26 Q. INCLUDING NEW JERSEY?
 27 A. YES.
 28 Q. AND YOU KNEW THAT MTBE HAD A VERY LOW TASTE AND ODOR

00714

1 THRESHOLD BY 1980?
 2 A. I THINK THERE WAS SOME -- AS FAR AS THE MTBE ODOR AND TASTE
 3 THRESHOLD, I THINK THERE WAS SOME, I WOULDN'T SAY CONTROVERSY,
 4 BUT THERE WERE SOME DIFFERENCES OF OPINION. THERE WERE SOME
 5 DIFFERENT STUDIES THAT HAD BEEN FLOATING AROUND IN THE 80'S AND
 6 90'S, AND AS I RECALL, SOME OF THOSE STUDIES WERE SHOWING MTBE
 7 ODOR AND TASTE CONCENTRATIONS IN THE HUNDREDS OF PARTS PER
 8 BILLION. OTHER STUDIES WERE SHOWING IT IN THE TENS OF PARTS PER
 9 BILLION.
 10 Q. BUT IF YOU WENT TO A COMMUNITY IN NEW JERSEY WHERE YOU WERE
 11 DEALING WITH THE PEOPLE, YOU WERE GETTING COMPLAINTS AT MUCH
 12 LOWER LEVELS LIKE --
 13 MR. JONES: OBJECTION. THE QUESTION IS VAGUE.
 14 MR. MILLER: LET ME REPHRASE, YOUR HONOR, IF I MAY. THANK
 15 YOU.
 16 MR. MILLER: Q. IF WE'RE TALKING ABOUT A COMMUNITY LIKE
 17 ROCKAWAY, YOU WERE GETTING COMPLAINTS OF TASTE AND ODOR PROBLEMS
 18 AT LEVELS BELOW 10 PARTS PER BILLION; CORRECT?
 19 A. AS I RECALL, IN ROCKAWAY, THE CONCENTRATIONS OF MTBE IN THE
 20 WELL FIELD WERE AROUND THE ORDER OF 14 PART PER BILLION. BUT,
 21 AGAIN, THERE'S AN ISSUE THERE. I THINK THERE'S A DIFFERENCE OF
 22 OPINION.
 23 THERE WAS ALSO ANOTHER OXYGENATE IN THAT DRINKING WATER THAT
 24 MAY HAVE BEEN CAUSING THE ODOR AND TASTE -- THE NOTICE OF THE
 25 ODOR AND TASTE AT THOSE LEVELS.
 26 Q. WHEN YOU WENT TO MANAGEMENT BY WHAT, 1981, ABOUT YOUR
 27 FINDINGS IN NEW JERSEY --
 28 A. WELL, AS SOON AS -- AS SOON AS WE WERE NOTIFIED THAT THERE

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1 WERE ODOR AND TASTE COMPLAINTS, WE DETERMINED THAT THE STATION,
 2 UPGRADING IT FROM THAT WELL FIELD, HAD CONTRIBUTED TO THAT. WE
 3 IMMEDIATELY NOTIFIED MANAGEMENT.
 4 Q. AND THAT WOULD HAVE BEEN BY 1981, APPROXIMATELY?
 5 A. I BELIEVE SO.
 6 Q. ALL RIGHT. AT THAT POINT WAS SHELL REQUIRED TO PUT MTBE IN
 7 ITS GASOLINE BY ANYONE?
 8 A. I'M NOT SURE WHAT REQUIREMENTS WERE IN 1981, NOT THAT I'M
 9 AWARE OF IT.
 10 Q. DID MANAGEMENT DISCUSS WITH YOU WHETHER MTBE SHOULD BE
 11 REMOVED FROM SHELL GASOLINE BASED ON WHAT YOU TOLD THEM?
 12 A. NO.
 13 Q. HAVE THEY UP TO THIS POINT TODAY?
 14 A. THERE HAVE BEEN -- THERE HAVE BEEN VARIOUS TEAMS LOOKING AT
 15 OUR ALTERNATIVES WITH THE CLEAN AIR ACT REQUIREMENTS REQUIRING
 16 SOME TYPE OF OXYGENATE IN VARIOUS PARTS OF THE COUNTRY. WE HAVE
 17 HAD INVOLVEMENT WITH SOME OF THESE MANAGERS SORT OF DESCRIBING
 18 TO THEM THE ENVIRONMENTAL ISSUES AROUND ETHER OXYGENATES AND
 19 ALCOHOL OXYGENATES.
 20 YOU MAY HAVE HEARD OF ETHANOL AND THAT GOING INTO GASOLINE,
 21 AND THERE WERE DIFFERENT ISSUES FOR EACH OF THOSE.
 22 Q. HASN'T SHELL MADE A DECISION NOT TO PUT MTBE INTO GASOLINE
 23 AT REFINERIES WHICH HAVE NOT USED IT IN THE PAST?
 24 MR. JONES: OBJECTION. QUESTION VAGUE AS TO TIME.
 25 THE COURT: DO YOU MEAN -- YES, WOULD YOU TELL US THE TIME
 26 THAT YOU'RE REFERRING TO?
 27 MR. JONES: AND PLACE.
 28 THE COURT: AT THE PRESENT TIME.

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1 MR. MILLER: Q. UP TO THE PRESENT TIME HAS SHELL MADE THE
 2 DECISION THAT IT WILL NOT USE MTBE AT REFINERIES WHICH HAVE NOT
 3 USED THAT INGREDIENT IN THE PAST?
 4 MR. JONES: OBJECTION. IRRELEVANT.
 5 THE COURT: HOW IS THAT RELEVANT TO THE ISSUE OF FAILURE TO
 6 WARN OR --
 7 MR. MILLER: COST BENEFIT, YOUR HONOR, WHETHER THE PRODUCT
 8 IS DEFECTIVE.
 9 THE COURT: OBJECTION OVERRULED.
 10 THE WITNESS: AS FAR AS I'M AWARE, EQUILON HAS MADE A
 11 DECISION NOT TO INTRODUCE MTBE INTO MARKETS THAT DON'T ALREADY
 12 HAVE MTBE IN IT.
 13 MR. MILLER: Q. HAS EQUILON ALSO MADE A DECISION TO PHASE
 14 OUT THE USE OF MTBE IN MARKETS WHERE IT IS CURRENTLY BEING USED
 15 BECAUSE OF CONCERNS ABOUT GROUNDWATER?
 16 A. I'M NOT PRIVY TO THEIR FINAL DECISIONS. AND IF THEY ARE
 17 DOING THAT -- I MEAN, SOME OF IT RELATES TO CERTAIN MANDATES
 18 THAT STATES ARE PLACING ON THE USE OF MTBE. THEY MAY BE --
 19 Q. AS FAR AS YOU KNOW, IF WE WERE TO DISCUSS A REASON SHELL
 20 MIGHT HAVE OR EQUILON MIGHT HAVE FOR PHASING OUT THE USE OF
 21 MTBE, IS THERE ANY PROBLEM WITH MTBE YOU'RE AWARE OF BESIDES ITS
 22 IMPACT ON GROUNDWATER?
 23 A. WELL, FROM AN ENVIRONMENTAL STANDPOINT, I WOULD SAY THAT
 24 WOULD BE THE KEY ISSUE.
 25 Q. ALL RIGHT. AND THAT WAS THE KEY ISSUE BACK IN 1981,
 26 CORRECT?
 27 A. AS WE BEGAN TO UNDERSTAND -- I MEAN, YOU'VE GOT TO REMEMBER
 28 THAT OUR LEVEL OF UNDERSTANDING HAS IMPROVED SIGNIFICANTLY OVER

Exhibit 14d



Shell Development Company

Interoffice Memorandum

JUNE 4, 1981

FROM: M. J. O'NEAL, MANAGER, ANALYTICAL-CHEMICAL/OIL
WESTHOLLOW RESEARCH CENTER

TO: J. A. ESLICK, STAFF ENGINEER, ENVIRONMENTAL
CONSERVATION OPERATIONS, OSP 1315

SUBJECT: ODOR AND TASTE THRESHOLDS FOR METHYL t-BUTYL ETHER
(MTBE) AND DIISOPROPYL ETHER (DIPE) (PROJECT 84027)

The subject thresholds were determined to assist Marketing in dealing with a possible nuisance problem related to MTBE and DIPE, gasoline additives, contamination in drinking water. Complaints from the community of Rockaway, New Jersey, were immediately involved in the request for obtaining these thresholds.

At the request of Operations - Environmental Conservation, Mr. R. A. Johnson, Westhollow Research Center arranged with TRC - Environmental Consultants, Inc., Wethersfield, CT, to determine the thresholds. TRC has one of the best reputations in odor measurement in this country.

The odor and taste thresholds for diisopropyl ether (DIPE) and methyl tertiary butyl ether were determined by TRC - Environmental Consultants.

The following table summarizes the results:

<u>Threshold</u>	<u>DIPE</u>	<u>MTBE</u>
Odor Detection	7 ppb	0.7 ppm (~700 ppb)
Odor Recognition	115 ppb	7 ppm
Taste Detection	15 ppb	0.7 ppm
Taste Recognition	22 ppb	4 ppm

The tests were carried out by a widely - accepted test procedure, called the triangle test. In this test, a concentration series of the test compound in water is used. Individual samples are compared

EQMODK06109



ODOR AND TASTE THRESHOLDS FOR METHYL t-BUTYL ETHER
(MTBE) AND DIISOPROPYL ETHER (DIPE) (PROJECT 84027)

2

with two water samples in each part of the test. For detection, the judge must correctly select the test sample as being "just noticeably different" from the two water samples. For recognition, the selection must be on the basis of recognition of the test compound.

In the odor tests, the head space vapors in equilibrium with the test solution are sniffed. In the taste test, the sample is taken from a covered container into the mouth through a straw.

As a rough confirmation of the existence of two orders of magnitude concentration difference in the odor thresholds of DIPE and MTBE, the Analytical laboratory (WRC) prepared aqueous solutions of these two compounds. At 70 ppb concentration, DIPE was easily detected and MTBE was not detected. This result conforms to the results reported by TRC.

The TRC experimenters noted that the taste of DIPE was moderately offensive and that of MTBE was very offensive.

For further details, please see the enclosed copies of the TRC reports or call Ralph Johnson at 493-7263.

M. J. O'Neal

RAJ/pkm

cc: T. R. Williams - OSP 1320
R. H. Dreith - OSP 1391
B. N. Bastian - OSP 1394
A. J. Gonzalez - OSP 1364
C. W. Kiener - MIL 1100✓ C. L. Oubre
J. W. Casey
D. G. Engelstad
M. A. Muhs
D. C. Baker
R. Szentirmay
R. A. Johnson

EQMODK06110

Exhibit 14e

REV. 5-78



Shell Oil Company
Interoffice Memorandum



APRIL 1, 1982

FROM: GASOLINE SPILLS - HEALTH HAZARD EVALUATION TASK FORCE

TO: HS&E DATA EVALUATION & PRIORITIZATION TEAM

SUBJECT: GASOLINE COMPONENTS HEALTH/ENVIRONMENTAL ASSESSMENT

Attached is a task force final report which reviews currently available health and environmental information related to groundwater contamination from gasoline spills. Eight key gasoline components have been identified which are considered potential groundwater contaminants of most interest to Shell. The toxicological/medical literature for these eight compounds is summarized. Direct observations of toxicity at or below part per million concentrations in drinking water are not available for the eight key gasoline components. Toxicological data obtained from non-oral routes of exposure are limited, but suggest that benzene would be the gasoline component most likely to be of concern from a chronic health point-of-view.

It is recommended that trade association, industry, or government sponsored on-going toxicological studies be examined from the point-of-view of their relevance to the ingestion of subpart per million concentrations of gasoline components in drinking water. Pending the results of these on-going studies, it may be appropriate to obtain chronic toxicological information concerning selected compounds via oral ingestion. Finally, Federal Water Quality Criteria, for gasoline components should be re-examined for the validity of their supporting data bases, in order to provide appropriate comments when the criteria are updated (Section 304, CWA).

For the task force,

A handwritten signature in cursive script, appearing to read "B. N. Bastian".

B. N. Bastian

BNB/ng

Attachment

EQWHCS004723



**TOXICOLOGICAL LITERATURE RELEVANT
TO CONTAMINATION OF GROUNDWATER**

METHYL-TERTIAL-BUTYL ETHER (MTBE)

This document is intended to provide a critical review of toxicological information which is considered to be relevant to the types of exposures likely to be encountered in association with a spill or leakage incident which results in contamination of groundwater. The information contained in this document is believed to be accurate at the time of issue.

Properties: $\text{CH}_3-\text{O}-\text{C}(\text{CH}_3)_3$ (MW = 88.15). MTBE is a clear, colorless liquid of low viscosity with a characteristic terpene-like odor. Highly Flammable. Density at 20°C = 0.7404 g/cm³. Boiling point = 55°C. Miscible with organic solvents; solubility in water at 20°C = 5% w; forms azeotropic mixtures with some solvents such as methanol. Vapor pressure at 25°C = 245 mm Hg. Flash point according to Abel-Pensky = -28°C. Explosion limits in air = 1.65% v (lower limit), 8.4% v (upper limit). MTBE does not autoxidize and therefore does not form explosive peroxides. Vapor density relative to air = 3.0. 1 ppm in air = 3.605 mg/m³ (refs 1,2,3).

Presence in Water: MTBE is not a common component of natural waters. The organoleptic properties of this ether indicate that MTBE contamination of water may be easily detected (refs 4,5):

Odor Detection Threshold in Water	680 ppb
Odor Recognition Threshold in Water	7000 ppb (est.)
Taste Detection Threshold in Water	700 ppb
Taste Recognition Threshold in Water	4200 ppb

Taste Description: "Very Offensive"

Absorption/Distribution: MTBE is apparently absorbed by both oral and inhalation routes. No information has been identified concerning percutaneous absorption of MTBE. No reports have been identified concerning the tissue distribution of absorbed MTBE, although some information may be obtained from a pharmacokinetic study currently in progress under the sponsorship of an ad hoc committee of the American Petroleum Institute (ref 7).



**TOXICOLOGICAL LITERATURE RELEVANT
TO CONTAMINATION OF GROUNDWATER**

DI-ISOPROPYL-ETHER (DIPE)

This document is intended to provide a critical review of toxicological information which is considered to be relevant to the types of exposures likely to be encountered in association with a spill or leakage incident which results in contamination of groundwater. The information contained in this document is believed to be accurate at the time of issue.

Properties: $(\text{CH}_3)_2\text{CH}-\text{O}-\text{CH}(\text{CH}_3)_2$. (MW = 102.17). DIPE is described as a colorless, mobile liquid with a sweet, slightly sharp odor. Highly flammable. Spontaneously explosive peroxides may form during storage of DIPE; reaction is accelerated by heat and light (stabilizers such as p-benzylaminophenol may be added). Density (20°C/4°C = 0.7258; Melting Point = -60°C; Boiling Point = 68-69°C. Vapor pressure at 20°C = 120 mm Hg; evaporation rate relative to n-butyl acetate = 8.0 (ie, fast evaporation); vapor density relative to air = 3.5. Flash Point = -28°C by TCC; explosivity limits in air = 1.4% v (lower limit), 7.9% v (upper limit); percent in "saturated" air at 25°C = 21% v. Slightly soluble in water (0.2% at 20°C); miscible with alcohol, ether. 1 ppm in air = 4.18 mg/m³ (refs 1,2).

Presence in Water: DIPE is not a common component of natural waters. The organoleptic properties of this ether suggest that DIPE contamination of water may be easily detected (refs 3,4):

Odor Detection Threshold in Water	7 ppb
Odor Recognition Threshold in Water	115 ppb
Taste Detection Threshold in Water	14.5 ppb
Taste Recognition Threshold in Water	22 ppb

Taste Description: "Moderately Offensive"

Absorption/Distribution: DIPE is rapidly absorbed by both oral and inhalation routes of exposure. No information has been identified concerning the percutaneous absorption of DIPE, nor have any reports relevant to the tissue distribution of absorbed DIPE (ref 2).

Metabolism: No relevant information identified.

Exhibit 15



UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

In re: Methyl Tertiary Butyl Ether (“MTBE”)

MDL No. 1358

Master File C.A. No. 1:00-1898 (SAS)

M21-88

This document relates to:

*Commonwealth of Puerto Rico, et al. v.
Shell Oil Co., et al., 07 Civ. 10470*

**PLAINTIFFS’ SUPPLEMENTAL RESPONSES TO
DEFENDANTS’ FIRST SET OF CONTENTION INTERROGATORIES AND
REQUESTS FOR PRODUCTION OF DOCUMENTS**

Plaintiffs Commonwealth of Puerto Rico and Commonwealth of Puerto Rico through the Environmental Quality Board (“Plaintiffs,” “Commonwealth,” or “PREQB”), by and through their attorneys, make the following Supplemental Responses and General Objections to Defendants’ First Set of Contention Interrogatories and Requests for Production of Documents to Plaintiffs.

GENERAL OBJECTIONS

1. Plaintiffs object to the Contention Interrogatories to the extent they seek information or documents outside the scope of discovery permissible under the Federal Rules of Civil Procedure.

2. Plaintiffs object to the Contention Interrogatories to the extent they seek information covered by the Attorney-Client Privilege, the Work Product Doctrine, or any other

4. Guayama Urbano Filtration Plant: Site ID E12004W

This site will be discussed in the expert report of Anthony Brown.

Supplemental Response to Interrogatory No. 1

Plaintiffs incorporate the objections and response to this interrogatory, and further respond as follows:

3. Pozo Club de Leones: Site ID S4C030W

Shell Oil Company; Shell Company Puerto Rico Ltd.; Shell Chemical Yabucoa, Inc.; Shell Trading (US) Company; Motiva Enterprises, LLC; Shell Western Supply and Trading Ltd.; Shell International Petroleum Co., Ltd.; Shell Western Services; Equilon Enterprises; Shell Oil Products U.S.; Chevron Puerto Rico, LLC; Texaco Puerto Rico, Inc.; Chevron U.S.A., Inc.; Texaco Petroleum, Inc.; Chevron International Oil Company, Inc.; Texaco Refining and Marketing, Inc.; Chevron Caribbean, Inc.; Chevron Estrella Puerto Rico, Inc.; Chevron USA, Inc.; Chevron Corporation; Sunoco; Sunoco R & M; Puerto Rico Sun Oil Company; Hovensa LLC; Hess Oil Virgin Islands; CPCPR; ConocoPhillips Company; Equilon Enterprises; Shell Oil Products U.S.; Sunoco; Sunoco R & M; Puerto Rico Sun Oil Company; and any suppliers of MTBE to Phillips CORE identified above.

Interrogatory No. 2

Separately, for each DEFENDANT identified in YOUR response to Interrogatory No. 1, above, IDENTIFY all facts and all DOCUMENTS that YOU contend prove, establish, show or demonstrate that a particular DEFENDANT caused the alleged DAMAGES at each DELINEATED TRIAL SITE AREA.

Response to Interrogatory No. 2

Plaintiffs assert the general objections. Plaintiffs also object that this interrogatory calls for expert opinion, and expert opinions are not yet due. Plaintiffs object to this interrogatory as

overly broad and unduly burdensome. Interrogatories demanding identification of “all facts and documents” are duplicative of other discovery and inconsistent with the federal discovery rules. Moreover, Plaintiffs object to the extent the interrogatory improperly attempts to force Plaintiffs to marshal all of their evidence.

Contention interrogatories do not require the answering party to provide a narrative account of its case or provide every fact that supports the allegation or contention. See 8B Fed. Prac. & Proc. Civ. Section 2167, n. 22 (3d ed.) As Judge Scheindlin has recently stated, “I don’t think [the plaintiffs] were supposed to lay out all of the evidence of every defendant at every site.” *See Hearing Transcript*, dated August 19, 2013, at 68:6-7 (in context of Defendants’ criticism of New Jersey plaintiffs’ responses to contention interrogatories). References provided in these responses to depositions, deposition exhibits, discovery responses, reports, other writings, or to designated Bates ranges, *inter alia*, do not encompass all of Plaintiffs’ evidence in support of any specific contention, but are illustrative. Notwithstanding and without waiving these objections, plaintiffs respond as follows.

As to all Trial Sites, Defendants associated with those Sites were a substantial factor in causing MTBE releases and contamination of groundwater at the Sites by supplying MTBE gasoline to the Sites without proper warnings or instructions, and with knowledge that MTBE would escape from the UST’s and dispenser systems and contaminate soil and groundwater. In addition, Defendants maintained control over the supply and inventory of MTBE gasoline at the trial Sites through branding and supply agreements, as well as through on-site inspections and control of amounts and methods of delivery. At some trial Sites, as described below, Defendants also owned or leased the property, underground storage tanks and dispensing equipment, and are managing on-site remediation. To date, there has been inadequate, if any, remediation at the Trial

Sites. To date, Defendants have failed to provide any evidence that Defendants provided adequate warnings regarding the dangers and hazards of MTBE with respect to the potential for groundwater contamination. In addition, Plaintiffs refer to and incorporate Plaintiffs' Responses to Interrogatories Nos. 1, 3 and 12 3, *including Exhibits A and B.*

There is ample evidence that gasoline distributed by defendants contained MTBE from the early 1980s up to, and including, the 2000s.

In mid-1987, for example, Arco Chemical Company (l/k/a Lyondell Chemical Company) was selling approximately “40 MB per month of MTBE” to a “Puerto Rico refinery” owned by Chevron. (See June 17, 1987, Bi-Weekly Update, From William S. Whitney to W.D. Kuhn, Bates #: LYON-PR0000344 to LYON-PR0000345.) This was later known as the Gulf refinery purchased by the Caribbean Petroleum Corporation. (May 24, 1990, Interoffice Letter from Mark Cain to Gary Lockhart, Subject: Puerto Rico Supply, at 2, Bates #: CITGO-PR 004085 to CITGO-PR 044106 [Watson Depo. (Nov. 13. 2013) at Exhibit 4].) Another memo later in 1987 confirms that both the Phillips (CORE) refinery and Gulf refineries were utilizing MTBE, stating:

“Contract terms are essentially final with Phillips for their 1988 requirement of 2.4-3.9 MB/D. Approximately on half of this volume will be resold to Caribbean Gulf Refining Corporation. We have offered to sell this material direct, but Phillips has the only economic freight capability to Puerto Rico. Phillips’ incentive to resell MTBE is to allow higher utilization of their ship. Phillips has also agreed to give us 10 MM gallons of methanol on a ratable basis a partial payment for the MTBE.”

(Nov. 3, 1987, Bi-Weekly Update, From William S. Whitney to W.D. Kuhn, Bates #: LYON-PR0000347 to LYON-PR0000348.) Similar Bi-Weekly reports made in 1993 confirm that Arco Chemical continued to sell large volumes of MTBE to Phillips CORE for Puerto Rico. (See April 13, 1993, Bi-Weekly Report, From W. S. Whitney to W.A. Callanan, Bates #: LYON-PR0000350 to LYON-PR0000351; Dec. 21, 1983, Bi-Weekly Report - Oxygenated Fuels, From W. S. Whitney to W. A. Callanan, Bates #: LYON-PR0000352 to YON-PR0000355.) Finally, MTBE sales records produced by Arco Chemical show that significant volumes of MTBE were sold to Phillips CORE in Puerto Rico from 1987 to 1993. (See Bates #: LYON-PR0000291 and LYON-PR0000291.) Virtually all defendants in this matter purchased gasoline manufactured by Phillips in Puerto Rico.

Arco Chemical/Lyondell also provided a declaration confirming that numerous refiners who shipped gasoline to Puerto Rico purchased MTBE from Arco Chemical between 1988 and 2007, including, but not limited to, Amerada Hess, St. Croix; Citgo, Lake Charles, Louisiana; Exxon, Baytown, Texas; Shell, Deer Park Texas; and Shell, NORCO, Louisiana. (See Dec. 3, 2012, Defendant Lyondell Chemical Company's Declaration Pursuant to Case Management Order #4.) Document produced by defendants in this matter confirm that gasoline containing MTBE was shipped from each and every one of these refineries during the relevant time period.

Additionally, an interoffice memo for Citgo Petroleum Corporation in 1990 confirms that the Gulf refinery (a/k/a Caribbean Petroleum Limited Partnership) was "importing 60 MD/month of cutter stock, reformate and or MTBE" to manufacture gasoline. (May 24, 1990, Interoffice Letter from Mark Cain to Gary Lockhart, Subject: Puerto Rico Supply, at 2, Bates #: CITGO-PR 004085 to CITGO-PR 044106 [Watson Depo. (Nov. 13. 2013) at Exhibit 4].) The memo further notes that Gulf was seeking to trade finished gasoline with Citgo in Puerto Rico for components

such as MTBE because Gulf “is basically short of octanes . . .” (*Ibid.*) The Citgo memo also notes that “Maraven is currently supplying Shell and Texaco with products, some of which is being delivered to Puerto Rico.” (*Ibid.*) Documents confirm that Maraven (a/k/a PDV) always utilized MTBE to manufacture gasoline that it exported, particularly to Puerto Rico. (*See e.g.*, January 11, 2001, Email from S. Fasold to R. Klett, Subject: Call Report, Mtgs with CILA and CORE, Bates #: CPCPR-051809 [“Discussed issue of MTBE in the mogas (all mogas from PDVSA will have MTBE present)”?] [Watson Depo. (Nov. 14, 2013) at 307:6-10, 412:6-17 [“ . . . it was common for MTBE to be in the gasoline from PCVSA.”] and Exhibit 25].)

From as early as 1990, up to and including 1998, Sunoco manufactured this gasoline at the Yabucoa refinery, and then delivered the gasoline to Peerless for final blending. (*See e.g.*, April 1, 1990, Agreement, between Sunoco and Peerless, Bates #: SUN PUERTO 0159684 to SUN PUERTO 0159710; Comas Depo. (Oct. 16, 2013), Exhibit 2 at Designated Issue No. 3, p. 2.) The Agreement between Sunoco and Peerless specifically provided for the addition of MTBE to the gasoline as a “Blending Component.” (Agreement at 1, SUN PUERTO 0159684.) Sunoco distributed this gasoline both at the Peerless rack and via barge to numerous defendants in this matter. Peerless has recently produced over 200,000 documents to the Commonwealth for review. (*See* January 15, 2014, Email from A. Sanchez to T. O'Reilly.) The Commonwealth anticipates that this production may contain documents concerning the blending of MTBE with gasoline sold and distributed by Sunoco.

Numerous gasoline sales agreements, including spot sale agreements, between defendants in this matter reference Colonial Pipeline Company Product Codes. Evidence shows that the Colonial codes referenced in these agreements specifically permit the use of oxygenates such as MTBE. (Charman Depo. (Nov. 21, 2013) at 76:20-78:7.) Indeed, none of these contracts or

sales agreements between the various defendants prohibited the presence of MTBE in gasoline delivered to Puerto Rico.

In 2000, defendants submitted reports on the content of MTBE in gasoline distributed by them since 1997. Defendants, and other refiners, uniformly admitted that MTBE was present in the gasoline they distributed during this time period. (See Sept. 28, 2000, Letter from Jorge Concha, Esso Standard Oil Co. (Puerto Rico), Bates #: XOM-PR-FILES-SUPP-473238 to 473242; Sept. 20, 2000, Letter from Candido Rivera, Texaco Puerto Rico Inc., Bates #: PR-LEG-0000073 to 0000075; Aug. 15, 2000, Letter from Juan Vasquez, The Shell Company (Puerto Rico) Limited , Bates #: PR-LEG-0000049 to 0000051; Aug. 15, 2000, Letter from Eric Guzman, Gulf Caribbean Petroleum Limited Partnership, Bates #: PR-LEG-0000053 to PR-LEG-0000055.)

Shell, including both United States and Puerto Rico entities, admits that “Shell did import gasoline with MTBE up to the mid-90s” in Puerto Rico. [SOL_ESI_2_00036527]. Documents produced by Shell and other defendants confirm that Shell purchased, delivered and supplied gasoline products to customers in Puerto Rico which contained MTBE. The following are examples of Shell’s purchase and distribution of gasoline containing MTBE:

- On or about January 31, 1995, Shell purchased 130,862.23 Barrels (5,496,213.66 U.S. gallons) of Premium Plus Conventional gasoline, with an MTBE content of 6.84% and 80,140.40 Barrels (3,365,896.80 U.S. gallons) of UL Regular Conventional gasoline, with an MTBE content of .74%, from Hess Oil Virgin Islands Corp. pursuant to Invoice No. 0130982 and Contract No. 95SH-2127. The shipment was delivered F.O.B. from St. Croix, U.S.V.I. via the Nord Farer ship to San Juan Puerto Rico. Declaration of Sol Puerto Rico Limited in Lieu of Deposition (January 16, 2014).

- On or about February 26 of 2003, Shell received gasoline from HOVENSA LLC via the Portland Barge to the Cataño Docks in San Juan Puerto Rico, pursuant to Purchase Order #500000622. SCPRL took title to 65,000 Barrels (2,730,000 U.S. gallons) of Conventional Caribbean Premium Gasoline, Product Code 539, EPA Batch ID-4296-08280-03-000092, Tank #7424, with an MTBE content of .05 Vol %. Declaration of Sol Puerto Rico Limited in Lieu of Deposition (January 16, 2014).
- On or about April 24, 2003 Shell received gasoline from HOVENSA LLC via the Portland Barge to the Cataño Docks in San Juan Puerto Rico, pursuant to Purchase Order #500000628 and #500000675. SCPRL took title to 50,000 Barrels (2,100,000 U.S. gallons) of Conventional Caribbean Premium Gasoline, Product Code 539, EPA Batch ID- 4296-08280-03-000201, Tank #7425, with an MTBE content of 0.18 Vol. Declaration of Sol Puerto Rico Limited in Lieu of Deposition (January 16, 2014). Evidence produced by Shell demonstrates that since 1979 most if not all gasoline supplied to the Site was, from the Cataño Terminal. (Jan. 16, 2014, Declaration of Sol Puerto Rico Limited in Lieu of Deposition.) The following documents also contain similar evidence of Shell's purchase, receipt, and distribution of gasoline containing MTBE: HOVIC 26573 - 26742; HOVENSA_014360 – 014427; SWSTXX003817; HOVENSA 016029-016087; SH-SWST-S-000006-000009; and HOVENSA 008658- 008659.

In 2002, Shell learned that “We have a cargo of 80,000 bbls of Premium gasoline on a barge in route to Puerto Rico for consumption by Shell Puerto Rico. Unfortunately, the cargo contains MTBE, about 5%... Luis Fernandez has checked with the EPA in New York and has been advised that at this time MTBE gasoline is not prohibited in the Puerto Rico region”...

“However, what I’m not totally clear on is the Shell policy/position” . . . “Work has been done to develop a high level risk assessment for all countries based on previous and current MTBE usage, environmental factors, vulnerability of groundwater etc. Puerto Rico is borderline high risk. The delivery of this cargo may be sufficient to push it fully into the high risk category.” [SOL_ESI_2_00035959-SOL_ESI_2_00035960]. As late as 2006, Shell personnel reported that MTBE could be imported into Puerto Rico by Shell by purchasing the gasoline from sources other than a Shell refinery. [SOL_ESI_2_00036532].

Finally, defendants and third parties have produced numerous Certificates of Analysis for gasoline shipped to Puerto Rico from various refineries during the relevant time period. A significant portion of these certificates show the presence of MTBE in gasoline delivered to defendants in Puerto Rico. A portion of these certificates have been used with witnesses during discovery in this matter.

These are just a few examples of the evidence demonstrating that MTBE was present in gasoline distributed by defendants in this matter. Plaintiffs reserve the right to update the response to this interrogatory based on newly produced materials and materials which are in the process of being produced.

As to each trial site, Plaintiffs respond as follows:

Plaintiffs’ Trial Sites

1. Chevron Phillips Core Refinery: Site ID N/A

CORE manufactured finished gasoline containing MTBE and / or TBA between 1982 and 2000. From 1982 to 2000, CORE purchased or received, at a minimum, approximately 6,183,960 barrels of MTBE and TBA for gasoline blending. *See, e.g.*, CPCPR-032100-119, CORE 16; CPCPR-691936-956, Scharre 8; CPCPR-032778-804, Sisson 3; CPCPR-085898-

Additional information concerning the contentions stated above can be found in the following depositions: May 30, 2013 Deposition of Plaintiffs (B. Green) and exhibits contained therein; August 21-22, 2013 Deposition of CPCPR and ConocoPhillips Company (H. Marin) and exhibits contained therein; August 23, 2013 Deposition of CPCPR and ConocoPhillips Company (J. Gallegos) and exhibits contained therein; September 5, 2013 Deposition of Don Sitton and exhibits contained therein; September 6, 2013 Deposition of Richard Klett and exhibits contained therein; September 25, 2013 Deposition of Juan Perez and exhibits contained therein; October 2, 2013 Deposition of Freddy Flores and exhibits contained therein; November 13, 2013 Deposition of Mark Scharre and exhibits contained therein; December 5, 2013 Deposition of Fred Sisson and exhibits contained therein; December 17, 2013 Deposition of Petrobras America Inc. (O. Dauzacker), and exhibits contained therein.

2. Shell #003042: Site ID 86-0948

The Shell Company Puerto Rico, Ltd. (now known as SOL Puerto Rico, or SOL) has owned the property at this station since 1975 and the underground storage tanks and dispensing equipment since 1979. Sol is the same corporate entity formerly known as The Shell Company (Puerto Rico) Limited ("SCPRL"). As it relates to Case No. 07-Civ.-10470, Sol is responsible for any liability that is attributable to SCPRL. Until December 2003, the gasoline sold and supplied to the Site was purchased and received by SCPRL mostly from Shell Western Supply and Trading Limited as well as other suppliers. Other Defendants named in response to Interrogatory No. 1 supplied MTBE gasoline to this station. These sales are documented by sales and transaction records produced by Sol, the Shell Defendants and other Defendants named in response to Interrogatory No. 1.

Records produced by Shell show that Shell made multiple purchases of gasoline from Phillips Puerto Rico CORE, Inc. from 1987 to 1994. (See Cintron Depo. (Sept. 27, 2013) at Exhibits 3-6.) Records produced by Arco Chemical outlined above demonstrate that gasoline manufactured by Phillips CORE during this time period contained MTBE. Certificates of analysis produced by Phillips CORE and other Defendants demonstrate that MTBE was present in gasoline distributed by Phillips CORE for many other years.

Starting in 1991, Sunoco entered into series of agreements with Shell to provide millions of gallons of gasoline from tankage leased by Sunoco at the Peerless terminal. (See e.g., August 1, 1991, Purchase/Sale Agreement, Delivered at Rack/Delivered by Barge, Bates #: SUN_PUERTO_0111818 to SUN_PUERTO_0111830; *see also* August 1, 1993, Purchase/Sale Agreement, Delivered at Rack/Delivered by Barge, Bates #: SUN_PUERTO_0174778 to SUN_PUERTO_0174782; *see also* August 1, 1991, Agreement between Shell, El Dorado Technical Services, and Sunoco, Bates #: SUN_PUERTO_0111841 to SUN_PUERTO_0111842.) Sunoco delivered gasoline to Shell both at the Peerless terminal rack and via barge to the Catano terminal. (See Agreements *supra*.)

In addition to the contract sale of gasoline to Shell, Sunoco made multiple spot sales of gasoline to Shell at the Catano terminal via barge. (See e.g., December 26, 1991, Letter from Agustin Lledo to Ivan Cintron, Bates #: SOL 28044-SOL28046; January 16, 1992, Letter from Ivan Cintron to Agustin Lledo, Bates #: SOL 27981; February 4, 1992, Invoice, Bates #: SOL 28028; February 11, 1992, Letter from Agustin Lledo to Ivan Cintron, Bates #: SOL 50617-50619; March 14, 1992, Letter from Agustin Lledo to Ivan Cintron, Bates #: SOL 28497-28499; July 2, 1992, Letter from Agustin Lledo to Ivan Cintron, Bates #: SOL 28378-28380. Mr. Ivan

Cintron as well as Mr. Louis Comas confirmed that Sunoco, in fact, shipped gasoline to Shell at Catano pursuant to these sales agreements. (*See generally*, Cintron Depo. (Sept. 27, 2013) at 19:10-20:3, 47:8-50:18, and Exhibits 20-25 attached thereto; Comas Depo. (Oct. 16, 2013) at 43:13-44:11, 398:14-408:11, and Exhibits 61-66 attached thereto.)

Sunoco also purchased large amount of finished gasoline from Phillips CORE which contained MTBE. (*See generally*, Deposition of Luis Comas taken in this matter on October 16-17, 2013.)

Texaco admitted that it routinely exchanged product with Shell in Puerto Rico. (Chevron Puerto Rico LLC's Declarations in Lieu of Deposition Testimony (Sept. 11, 2013) at 3 [Texaco Puerto Rico, Inc.'s "... records reflect product exchanges with Esso and Shell."].) Texaco also admitted that it sold "unbranded" gasoline to Sol Puerto Rico. (Chevron Puerto Rico LLC's Declarations in Lieu of Deposition Testimony (Sept. 11, 2013) at 5.)

Texaco also made a number of spot sales of gasoline to Shell for distribution in Puerto Rico. In March 2002, for example, Texaco sold Shell 30,000 barrels of unleaded regular gasoline. (*See e.g.* March 16, 2002, Spot Sale Agreement between Texaco and Shell, Bates #: SOL_ESI_2_00083145 to SOL_ESI_2_00083150.)

Texaco also admitted that it shared shipments of imported gasoline with Shell. (Chevron Puerto Rico LLC's Declarations in Lieu of Deposition Testimony (Sept. 11, 2013) at 3 [Texaco Puerto Rico, Inc.'s "... records reflect shared offshore gasoline shipments to TPRI, Citgo, Esso and Shell . . ."].)

On October 27, 2003, SCPRL and Shell Chemical Yabucoa, Inc. executed an assignment agreement whereby SCPRL assigned and transferred to Shell Chemical Yabucoa, Inc. all of its rights and obligations related to the supply and delivery of gasoline to the Site. SOL Focus Site Prod. 5/22/2012_8754 - 8757. Shell Chemical Yabucoa, Inc. supplied gasoline to the Site from December 2003 until July 2006. From August 2006 to June 2008, the gasoline sold and supplied by Sol to the Site was refined by Shell Chemical Yabucoa, Inc. Upon Shell Chemical Yabucoa, Inc.'s shutdown of its refinery operations in June 2008, the gasoline sold and supplied by Sol to the Site was purchased from Shell Chemical Yabucoa, Inc., who purchased the gasoline from various traders and stored the product in its tank field in Yabucoa, Puerto Rico. Since 1979 most if not all gasoline supplied by SCPRL and Sol to the Site was delivered by Camioneros Cooperativa de Transporte de Carga, from the Cataño Terminal.

Numerous reports produced by and to the Shell Defendants document the fact that MTBE has been released and has contaminated groundwater at this site. *See, e.g.*, Environmental Site Assessment Report, July 2012 [PR-MTBE-TSCaseFiles_006220 to PR-MTBE-TSCaseFiles_006340]; PR-MTBE-2013DATA_007720 to PR-MTBE-2013DATA_008518; Interrogatory response 15 to Sol Puerto Rico Limited's Responses and Objections to the Commonwealth of Puerto Rico's First Set of Interrogatories Requests to Defendants Regarding Plaintiffs' Trial Sites; Exhibit 13 to Michael Colavita, December 14, 2013, deposition; Exhibits 41, 44 and 46 to the Deposition of CPCPR and ConocoPhillips Company (Hector Marin), August 21-22, 2013.; deposition of Yamira Rivera August 14, 2013. Deposition of Hector Marin, August 21, 2013 and exhibits thereto, specifically, Exhibit 41. There is evidence that SOL Puerto Rico Limited, an affiliate of Sunoco Inc., and Shell Company Puerto Rico Limited, an affiliate of Shell Oil Company and Shell Chemical Yabucoa, Inc., supplied gasoline to Shell-branded

stations in Puerto Rico, including MTBE gasoline. See also evidence of supply and manufacture of MTBE gasoline by Phillips CORE *supra*.

Sol has recently produced groundwater sampling data taken at this Trial Site, including sampling for MTBE. Plaintiffs have not had an adequate opportunity to review and analyze this data, and specifically reserve the right to update this response based upon this newly produced data.

3. **Esso CO-364: Site ID 86-1075**

Esso Puerto Rico owned the property, underground storage tanks and dispensing equipment at this site from at least 1967 to October of 2008, when the property and equipment were purchased by defendant Total Puerto Rico. Other Defendants named in response to Interrogatory No. 1 supplied MTBE gasoline to this station. These sales are documented by sales records produced by Esso and other Defendants named in response to Interrogatory No. 1. Numerous reports produced by and to Esso and its consultants document the fact that MTBE has been released and has contaminated groundwater at this site. *See, e.g.*, Phase II Environmental Evaluation Report Former Esso Service Station 364, December 4, 2013 [XOM-PR-CO364-005876 to XOM-PR-CO364-006433]; Table 7 – Phase II Environmental Evaluation Report, December 4, 2013 [XOM-PR-CO364-006434 to XOM-PR-CO364-006435]; PR-MTBE-2013DATA_006091 to PR-MTBE-2013DATA_006729; Deposition of Arturo Hernandez, December 13, 2013 and exhibits thereto including, specifically, Exhibit 4 and 31 Exhibit 31 to Arturo Hernandez, December 13, 2013 deposition; Exhibits 41-44 and 47 to the Deposition of CPCPR and ConocoPhillips Company (Hector Marin), August 21-22, 2013. Deposition of Hector Marin, August 22, 2013 and exhibits thereto including, specifically, Exhibit 41.

2013) at 15:3-16.) Thus, multiple deliveries of gasoline to the terminal tanks would be commingled and would make up a portion of the gasoline pulled at the rack for delivery to a station.

Interrogatory No. 23

State whether YOU invoke or rely on any of the following theories of alternative liability to prove causation or as evidence to establish that any or all DEFENDANTS are liable for the alleged DAMAGES in any or all of the DELINEATED TRIAL SITE AREAS:

- A. market share;**
- B. commingled product; and/or**
- C. any other theory or theories of alternative liability.**
- D. If YOUR answer to Part (C) is in the affirmative, IDENTIFY the theory or theories upon which YOU rely.**

Response to Interrogatory No. 23

In addition to the general objections, plaintiffs object to the extent the interrogatory seeks plaintiffs' attorney work-product or information covered by the attorney-client privilege mischaracterizes alternative liability theories as "evidence." Plaintiffs object to this interrogatory as overly broad and unduly burdensome. Plaintiffs also object on the basis that discovery is ongoing and Defendants have not fully responded to plaintiffs' request for information relevant to answering this interrogatory. Interrogatories demanding identification of "all DOCUMENTS, facts or other evidence" are duplicative of other discovery and inconsistent with the federal discovery rules. Plaintiffs object to this interrogatory on the grounds that it improperly seeks to compel plaintiffs to elect a single theory of liability prior to trial. Plaintiffs disagree that it is obligated to make such an election at this time, and further disagree that each theory is mutually

exclusive. Plaintiffs are entitled to rely on all relevant theories which are consistent with the evidence produced at trial.

Notwithstanding the foregoing objections and without waiver of such objections, Plaintiffs respond that they will rely on a comingled product theory of liability at trial for the Club de Leones trial site.

Supplemental Response to Interrogatory No. 23:

Plaintiffs incorporate the prior objections and response, and further respond as follows: Plaintiffs will rely upon a commingled product theory of liability as to the Club de Leones trial site.

Interrogatory No. 24

If YOU invoke or rely on any of the theories listed in Interrogatory No. 23 as evidence of or to establish liability, state for each the following:

- A. which DEFENDANTS YOU contend are liable under each theory for the alleged DAMAGES in any of the DELINEATED TRIAL SITE AREAS; and**
- B. the percentage or apportionment of the alleged DAMAGES that YOU contend each of the DEFENDANTS should bear or should pay under each theory for each DELINEATED TRIAL SITE AREA.**

Response to Interrogatory No. 24

In addition to the general objections, plaintiffs object to this interrogatory on the basis that it seeks attorney work product and mischaracterizes alternative liability theories as "evidence." Plaintiffs also object on the basis that the interrogatory calls for expert opinion. Plaintiffs also object on the basis that discovery is ongoing and defendants have not fully responded to plaintiffs' request for information relevant to answering this interrogatory.